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THE HISTORIC LANDSCAPE OF FORT SPOKANE : A DESIGN PROPOSAL

SUMMER 1985

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The Historic Landscape of Fort Spokane:

A Design Proposal

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Summer 1985

Under the joint direction of Coulee Dam National Recreation Area and the Cultural Resources Division, Pacific Northwest Region, Seattle, Washington.

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TABLE OF CONTENTS

Forward	i
Introduction	1
Context	3
Research	7
Research Findings: Historic Overview	9
Analysis and Evaluation	25
Design Development	27
Recommendations	29
Foundation Treatments	33
Staging Areas	37
Phasing Concepts	39
Appendix and Bibliography	47

FORWARD

I began life as a small seedling on a level plateau high above the bed of the raging Spokane River. I grew in size and strength with each passing year in the wilderness of abundant sunshine and rich soil, lulled by the roaring current of the river. The icy water of the Spokane poured through a two hundred foot canyon just below me on its way to meet the mighty Columbia a mile downstream. Only the gentle songs of the native birds seeking shelter in my branches broke the quiet stillness of this place.

One day in the late summer of 1821, dark clouds appeared along the hilltops surrounding my land and began to hurl bolts of lightning across the sky. The fire that started and spread so rapidly, eating away at each living thing in its path, left me with the dark scars I still carry.

As far back as I can remember I had seen only the dark skinned natives pass beneath my branches hunting the deer and catching the salmon whose silvery fins made the river come alive from shore to shore. But a new people entered my land in the early 1800s and sought the riches that were found along the shores of the river. They were light of skin and spoke in a tongue from a land called England. These Englishmen came only when the snow gently covered all in a blanket of whiteness and the animal furs were deep and warm. Each winter they came seeking the riches the pelts brought them.

The trappers were followed in the 1860s and 70s by large groups of families who came to homestead the wilderness country around me. Day to day they carved small farms from the once tree-covered land along the rivers. But the practices of the settlers disturbed the Indians. Neither group could understand the problems of the other and soon open fighting broke out between them. More settlers came in larger numbers and began to drive the Indians from their native hunting grounds and the small battles became wars.

In 1880 a band of men dressed in bright blue uniforms covered with polished brass buttons arrived on my plateau and set up their tents in the shade of my limbs. They were soon followed by more soldiers, called in to keep the peace in this land that had seen many struggles between the settlers and the Indians. They began to construct buildings and houses until soon I was surrounded on all sides. Men dressed in their finest blue uniforms with white gloves marched to the staccato beat of drums and the brassy call of the bugle near my base for eighteen years. Then suddenly in the spring of 1898 the men in blue were called away from their fort leaving a city of forty-five buildings known as Fort Spokane. They marched away and never returned.

The voices of children were soon erasing the familiar echo of the drums and bugles from the parade ground. A game of baseball was being played where only a short time before soldier's feet had marched. Hundreds of Indian children from all over the Northwest were coming to live in the old fort buildings and learn the ways of the plow and the language of the settlers. Each school day was filled with "readin', 'ritin', and 'rithmetic" in the old barracks, but free time was spent running and playing under my branches. With these children a new happiness was added with each small

boy's laughter. But there was also the sadness of being away from home for nine months of the year, away from parents and friends. In 1913, the Indian children left to enter schools close to their families.

During the years that passed the buildings of the old fort began to fall apart and were soon in shambles. As years passed local farmers took the buildings apart for the lumber and used it on their ranches. Fires and vandals made what was left of little use and even the foundations began to sink slowly into the ground.

Then in 1942 the raging current of the river slowly stopped and the waters were pushed back slowly filling the canyon. I heard that a giant dam had been built and my river was being turned into a huge lake. It was called Franklin D. Roosevelt Lake.

Lake Roosevelt drew people in boats to the shores and tents and trailers always to be found somewhere along the beach. Each time the tourists passed the once proud old fort they wondered about its past and the story it held.

Finally in 1960, the United States National Park Service took charge of the crumbling structures that had served so well. The few remaining buildings were restored, long forgotten foundation stones were again brought to the light and once again the echo of drums and bugles pierced the air around my tired limbs.

As my health begins to fail and my life is nearing an end I hope that the echos of drums and bugles will be forever remembered across my land.

THE LEGEND OF A PONDEROSA PINE THAT LIVED ON THE PARADE GROUNDS

INTRODUCTION

INTRODUCTION

Established in 1880, Fort Spokane was one of the last military forts built in the Northwest. Its primary purpose was to maintain peace and settle potential conflicts between Indians on the Northern Columbia Plateau and white settlers arriving in the area. For over fifteen years the fort carried out its mission, creating a significant impact on the social fabric of both groups. After the post was placed on caretaker status in 1898, the Colville Indian Agency moved to the fort and established an Indian school and hospital. This facility continued for ten years. From 1914 to 1929 that same agency used the old post as a hospital for children with respiratory diseases. The Indian Agency left the post in 1929, and for the next thirty years, Fort Spokane was largely an abandoned site. Many of the structures and buildings were dismantled or removed during these years. For a period, local farmers used the grounds of the fort for cultivating crops and grazing livestock. In the 1930's construction of Grand Coulee Dam created Lake Roosevelt, and the recreational use of the area increased dramatically. Finally in 1960, jurisdiction of Fort Spokane was transferred to the National Park Service which maintains the fort today as a historic site within Coulee Dam National Recreation Area.

Over the years the National Park Service has stabilized, and currently maintains, four (remaining) historic structures. While the buildings themselves play an important role in the story of Fort Spokane, much of the historic fabric and (coherent) character of the site remain today in the landscape. A number of foundation ruins along with primary landscape patterns and relationships, though ill-defined, are intact. In addition, a variety of key landscape structures, including gates, fences, boardwalks, and plant materials potentially can contribute a great deal to understanding the historic fabric of the complex as a whole.

PURPOSE

In 1984 a preliminary landscape study explored and identified significant historic landscape patterns, components and remnants that define the historic integrity of the fort.

The purpose of this project is to build on that base and develop a landscape design that specifically addresses the "readability" of the historic scene. Although it is not the intent to reconstruct fabric, many of the key landscape components can be re-established or "drawn-in" relatively easily. Goals for this project include expanding visitor understanding of the site through enhancement of historically significant features, and expanding contemporary use of the site while preserving historic integrity.

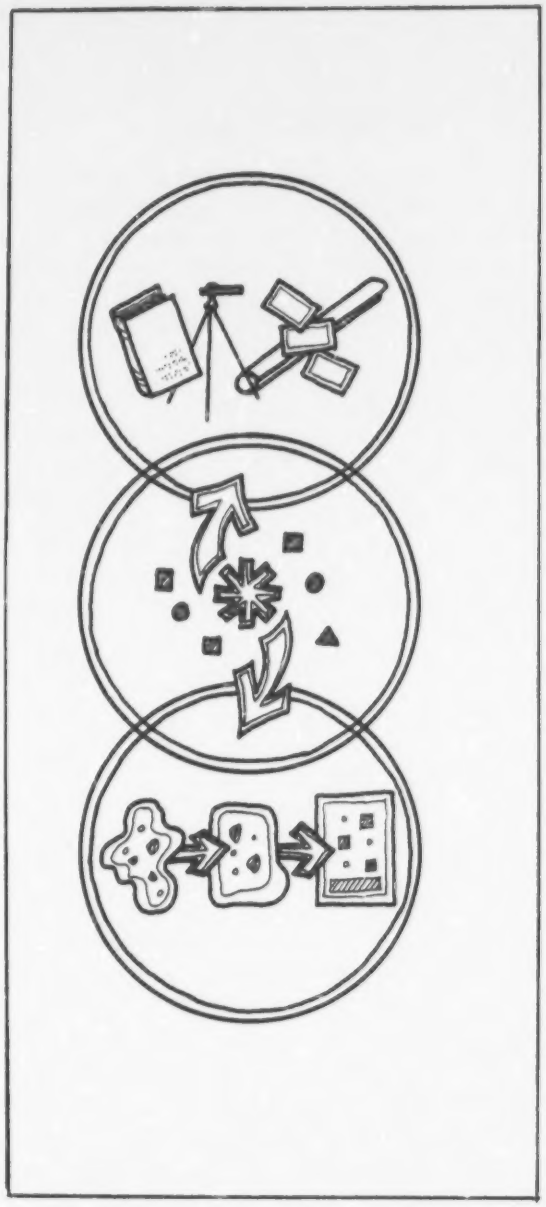
PROCESS AND SCOPE

The project was conducted over a twelve week period and was divided into three primary phases of different lengths and overlapping time frames. The first phase, lasting approximately four weeks, included general research and a review of historic resources. A comprehensive site survey, in which all existing site features were documented, was also done during this phase of the project. The findings from this research and documentation are included in Part I of this report.

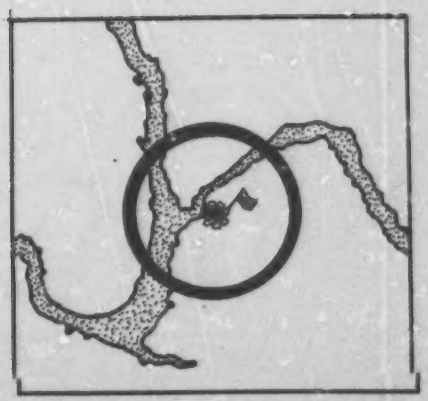
In the second phase of the project historic information and base data from the site was mapped and analyzed. From that synthesis an evaluation of historic landscape components was conducted according to National Register criteria, and a determination of significance and integrity was made. This portion of the project covered approximately three weeks and is explained in Part II of this report.

The final phase of the project, design development, consisted of integrating research, site data, and significant historic features into a comprehensive design proposal for the fort. The design is illustrated both verbally and graphically in Part III of this report. Specific recommendations suppport the primary design features and a preliminary phasing plan outlining implementation procedures is also included.

The intent of this project is to identify significant historic landscape patterns and develop an appropriate landscape design for the grounds of Fort Spokane based on those patterns. It is not within the scope of the project to provide construction drawings, specific details, or cost estimates. Further, specific elements of the design as discussed in Part III of this document will require additional study before undertaking design implementation (see recommendations).



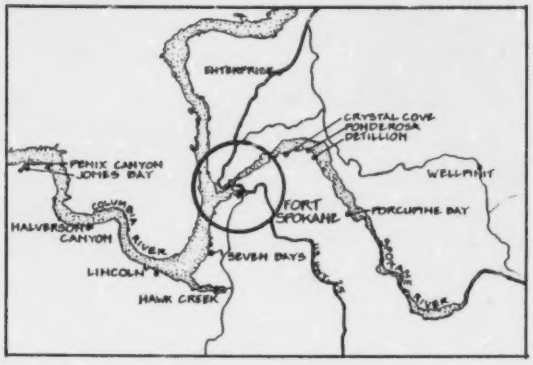
CONTEXT



GEOGRAPHICAL AND PHYSIOGRAPHIC SETTING

From the western provinces of Canada, the Columbia River cuts and carves through a vast plateau region in the northwest United States. This huge expanse of land extends west to the slopes of the Cascade range and east into Montana. To the south is the Great Basin country of Oregon and Idaho, and northward, the plateau stretches up to the upper Fraser and MacKenzie river

tributaries. Slicing through this plateau, the dramatic land of the Grand Coulee formed 20,000 years ago, unfolds and exposes breathtaking stratified rock-faced gorges rising high above Banks Lake. South of this area the plateau is largely flat and arid, but to the north, the land starts its slow change to rolling agricultural land as it meets the edge of the Palouse country. From here, tree-covered hills and pine forests carry down steep banks to the edge of the Spokane and Columbia Rivers. A mile north of the confluence of these rivers is the site for this study.



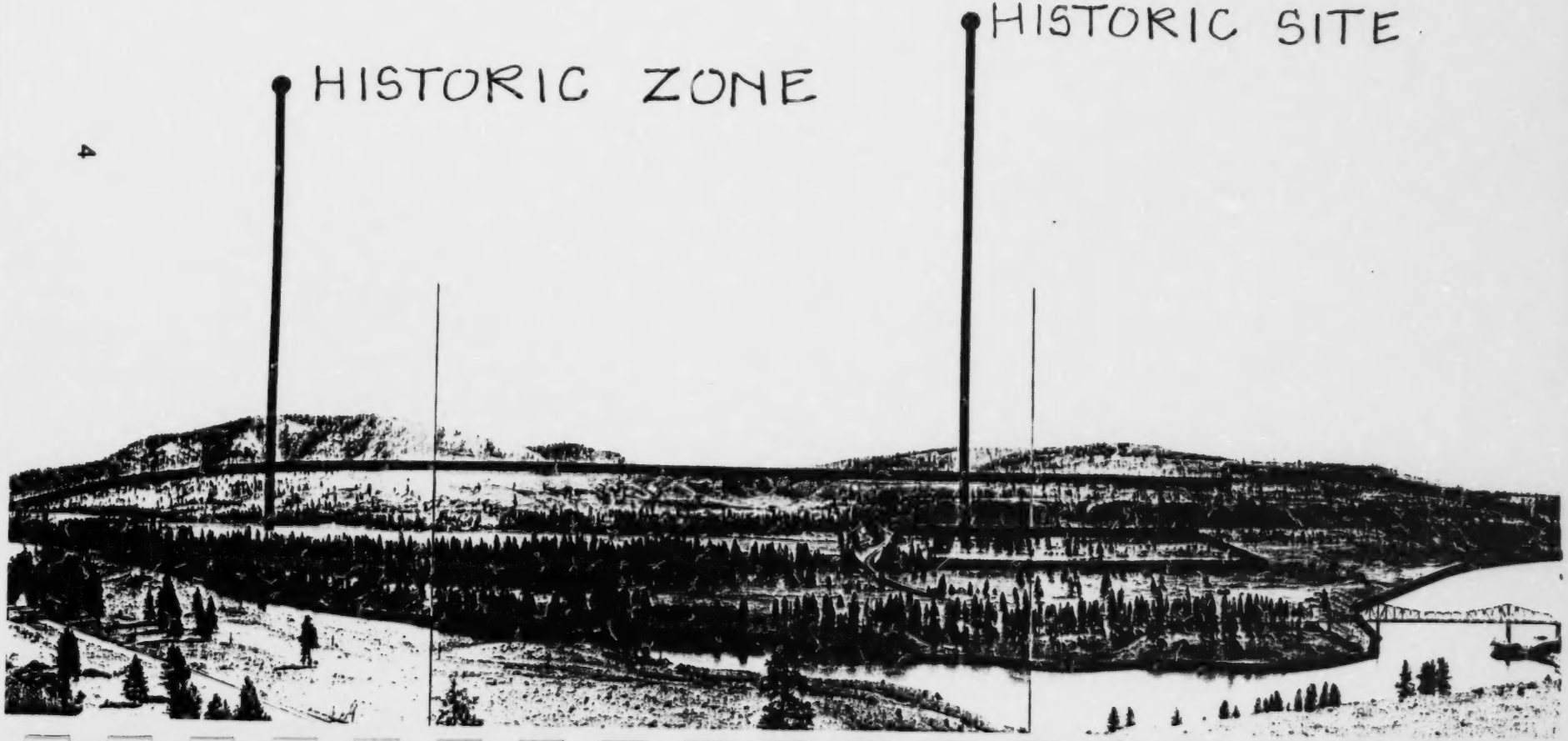
SITE BOUNDARIES

The original 640 acres of Fort Spokane lie for the most part along a portion of high plateau on the south side of the Spokane River. Once sparsely wooded, with fresh water, easy access, and large open areas for grazing, the site was well-suited to the needs of the military. The actual fort structures covered approximately eighty acres on a broad level bench 400 feet above the Spokane River.

For the purposes of this study all 640 acres of the original military reserve are considered part of a historic zone and provide the contextural envelope for this study. This design project, however, focuses on the eighty acres that supported the primary structural complex of the fort. This area, in addition to all designated view corridors, the spring house, reservoirs, and areas directly adjacent to the fort are considered the historic site for this project.

PANORAMA

VIEW TO THE SITE - ACROSS THE SPOKANE RIVER.
FROM THE NORTH. (PHOTOGRAPH A, ca. 1935)



CURRENT CONDITIONS

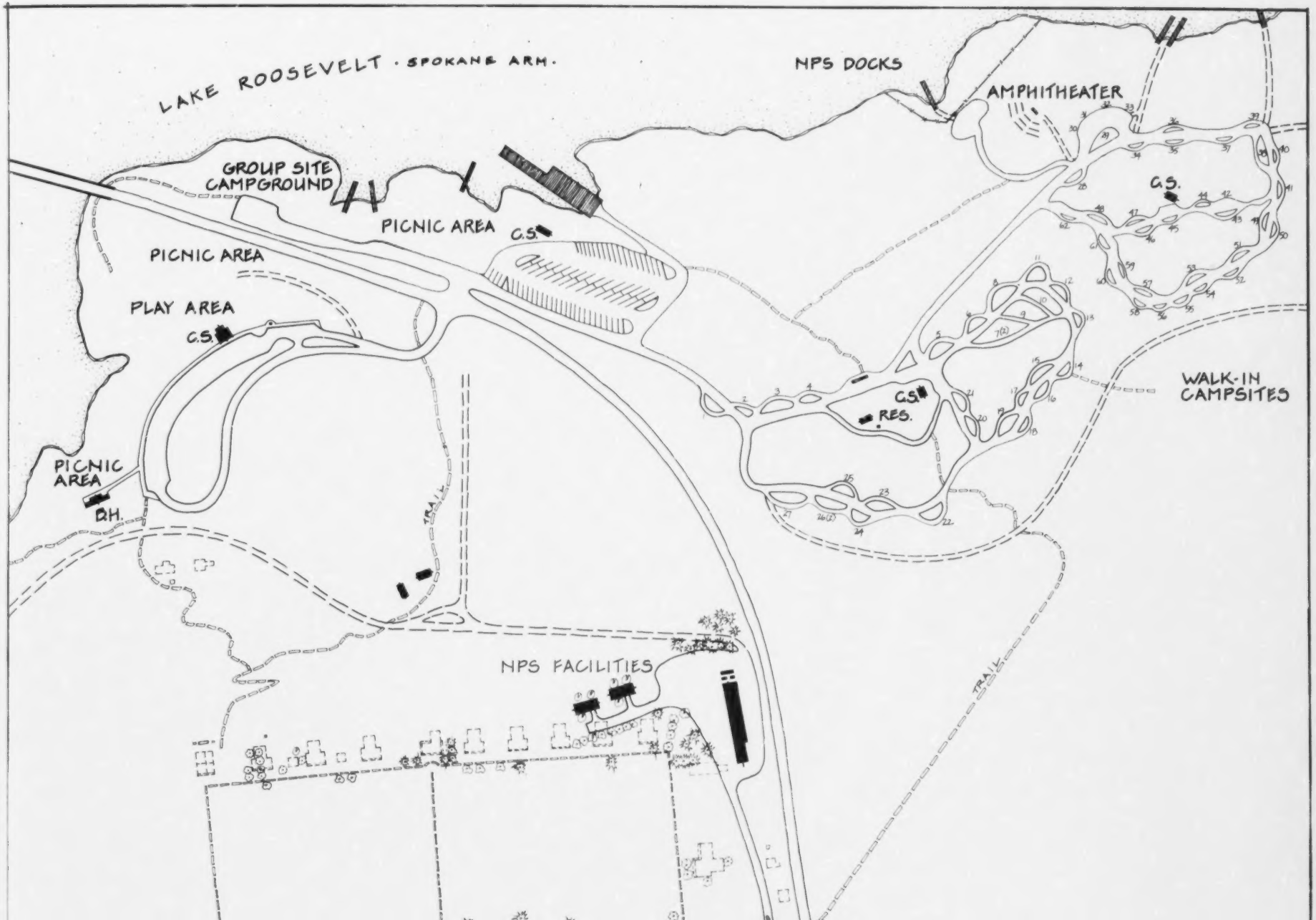
Current vehicular access to the site is off State Highway 25, approximately 25 miles north of Davenport, Washington. A short access road ends at a parking lot located southwest of the historic guardhouse, which presently serves as a visitor center. Another access road leads to National Park Service (NPS) facilities, including ranger offices, a maintenance building, and employee housing units in the north corner of the site. Unpaved service roads are located along the toe of the east ridge, and behind the NPS facilities, north to the campground.

The quartermaster stable is one of three historic buildings on the level river bench.

NPS maintenance building with foundation ruin in the foreground.

Of the original 45 buildings constructed by the military, three remain standing on the level river bench: the guardhouse, quartermaster stable, and powder magazine. Other significant historic structures, including the springhouse and second reservoir, are standing and stabilized on the east ridge. There are twenty-five foundation ruins, many of which are exposed and relatively unstable. A few foundations are delineated with rock, and seven have a portion of wall remaining or re-established.

An interpretative trail circles the complex with several wayside stops. This trail also leads up to the reservoir and winds up the ridge providing a good vantage point for viewing the historic site as a whole. Other trails lead off the site to riverfront camping areas. Vegetation on the site is limited to a few box elders, ponderosa pine, douglas fir, locust, and native brush and grasses.


LAKE ROOSEVELT · SPOKANE ARM ·
NPS DOCKS
AMPHITHEATER
GROUP SITE CAMPGROUND
PICNIC AREA
C.S.
PICNIC AREA
PLAY AREA
C.S.
C.S.
C.S.
RES.
WALK-IN CAMPSITES
PICNIC AREA
D.H.
TRAIL
NPS FACILITIES
TRAIL

FORT SPOKANE — EXISTING —

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

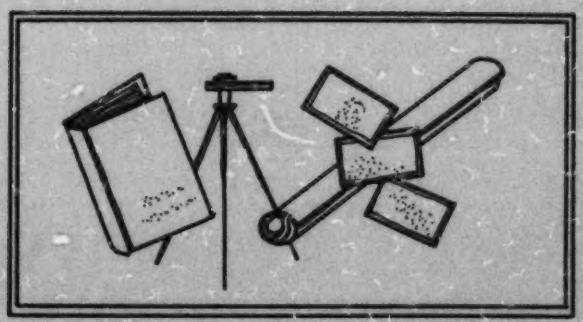
NORTH
NO SCALE

- MAP SOURCES AS NOTED IN: THE HISTORIC LANDSCAPE OF FORT SPOKANE: A DESIGN PROPOSAL
- COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985

DRAWN BY NIEDZWIECKA
· SEPTEMBER 1985

SHEET 1 OF 7

RESEARCH



RESEARCH

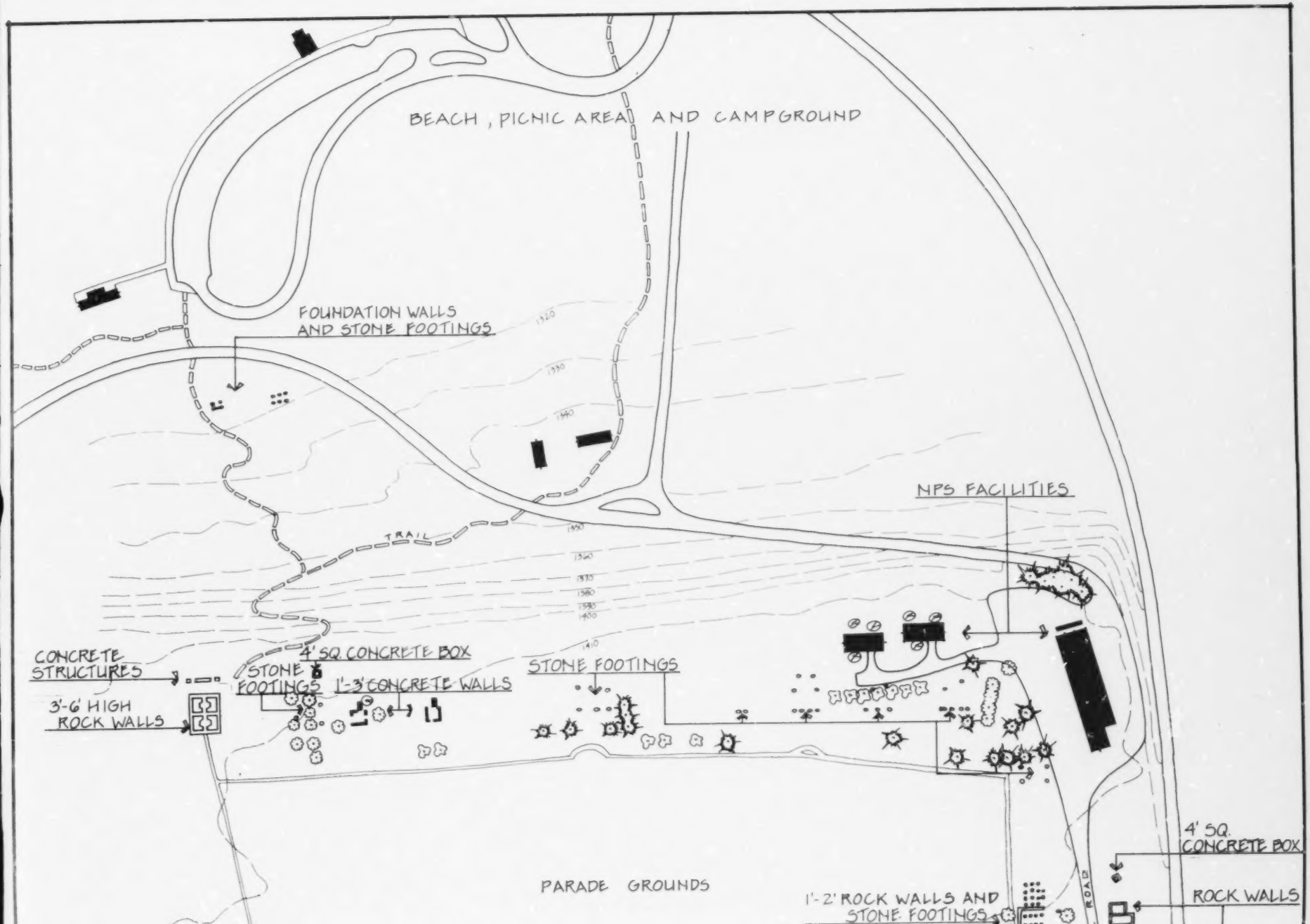
The primary purpose of conducting research was to explore not only the physical structure of the fort but also the social contexts and cultural landscape character of the site over a hundred year period of use. This involved both historical research and comprehensive documentation of existing conditions at the fort.

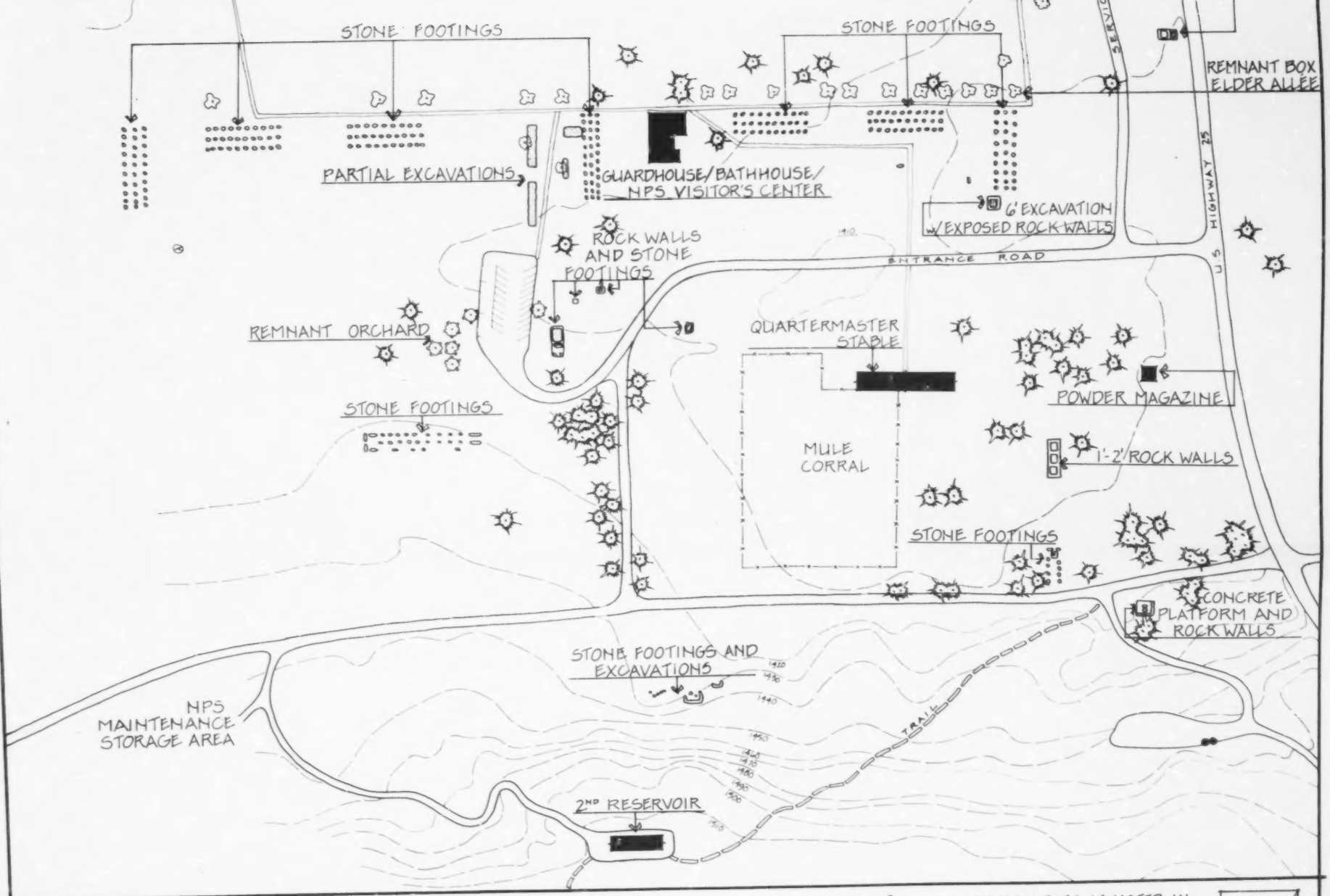
Research began with a review of previous studies done by the National Park Service and others pertaining to Fort Spokane (see bibliography). Although only one study addressed landscape issues directly, the documents as a whole provided a resource base for the entire project.

Historical research involved a review and re-examination of various resources including oral histories, historic maps and documents, historic photographs, and newspaper accounts related to the site. The maps delineated the proposed plans and structural development of the post by the military in 1882. Historic photographs helped identify a variety of detail elements, special features, plant materials, and, significantly, along with the oral histories, began to give a feel and sense of place (see FINDINGS section below). The main repository of historic material used in this report was the collection on file at National Park Service Headquarters, Coulee Dam National Recreation Area, Coulee Dam, Washington.

Documentation of existing conditions at the site required gathering basemaps on file in the NPS Pacific Northwest Regional Office and at Coulee Dam. Along with the archival military maps of 1882, these site maps (from previous Park Service projects at the fort) provided a preliminary field map for the project.

The actual field survey took place over several weeks. This portion of the project had to be expanded beyond original plans, as existing map sources were inconsistant and in some cases, inaccurate. Measurements taken at the site located all existing conditions and features, including vegetation, above ground structures, foundation ruins, and circulation patterns. Discrepancies between site maps completed prior to this project and measurements taken during the 1985 field work were resolved in two ways. A 1959 engineered survey of the site located major trees and proved consistant with field measurements. In addition, supplementary data was obtained from aerial photographs, and in some instances, historic photographs. From this process, an accurate base map was made.


BEACH, PICNIC AREA AND CAMPGROUND
FOUNDATION WALLS AND STONE FOOTINGS
TRAIL
NPS FACILITIES
CONCRETE STRUCTURES
3'-6' HIGH ROCK WALLS
STONE FOOTINGS
4' SQ. CONCRETE BOX
1'-3' CONCRETE WALLS
STONE FOOTINGS
PARADE GROUNDS
1'-2' ROCK WALLS AND STONE FOOTINGS
ROAD
4' SQ. CONCRETE BOX
ROCK WALLS



FORT SPOKANE—EXISTING—

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

NORTH

100 50 0 100
SCALE : 1" = 100'-0"

- MAP SOURCES AS NOTED IN THE HISTORIC LANDSCAPE OF FORT SPOKANE : A DESIGN PROPOSAL
- COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985

DRAWN BY NIEDZWIECKA · SEPTEMBER 1985

SHEET 2 OF 7

RESEARCH FINDINGS:
HISTORIC OVERVIEW

HISTORICAL CONTEXT 1880 - 1900

Formally declared a military post in 1882, Fort Spokane was one of the last frontier army posts established in the Pacific Northwest. Strategically located near the confluence of the Spokane and Columbia Rivers, it consolidated two other military posts (Chelan and Colvile) and provided a formal barrier between Indian tribes of the Northern Columbia Plateau and white settlers arriving in the area. While there never was a serious confrontation between the two groups, there was in the minds of those involved enough tension to warrant a military presence.

In 1880, General O.O. Howard, military commander of the Department of the Columbia, appointed a survey team to explore the region and locate a site for the new post. The three member team quickly found what seemed an ideal site for the new post and wrote in a letter to the Adjutant General in Vancouver, Washington that same year:

> The site is a level plateau, gravelly and partly covered with open pine timber...four hundred feet above the river level...
>
> Its water supply would be obtained from several large springs in the rolling hills back of the plateau...timber for fuel and building is at hand of fine quality and vast quantity.
>
> Grazing facilities are unlimited and unexcelled. The site can easily be reached by wagon from several directions...
>
> Its supply line from the Northern Pacific Railroad would be good and about fifty-five miles in length, nearly all of which is already travelled road. (HRS, 1980)

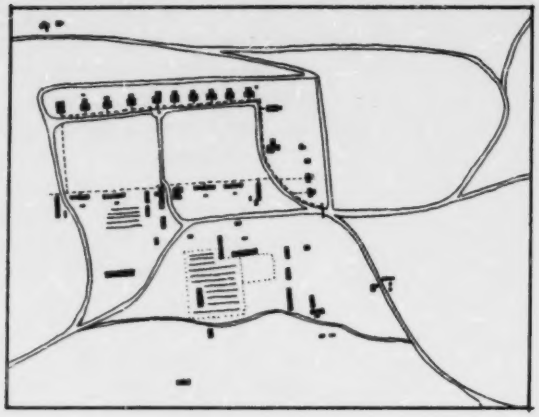
With water nearby, land for grazing, timber for building, and ready access to supply markets, the site seemed ideal.

Within five months of the report, troops were in permanent camp, living in tents along the Spokane River. In 1881, General Howard allocated funds to begin construction of the new post, and several structures were built on the broad plateau. The future of the facility remained uncertain, however, as insufficient funds and indecisiveness by the War Department slowed construction.

General Howard was replaced as commander of the region later that year and the new commander, General Miles, was able to expedite the original plan. Within months of his appointment Miles made an appeal for additional funds to complete the fort. The War Department granted the request, and in 1882, President Chester A. Arthur signed the authorization establishing Fort Spokane Military Reserve (Camp Spokane was officially renamed Fort Spokane by the War Department on February 11, 1882).

STRUCTURAL COMPLEX AND LAND USE

The design of the fort complex and the majority of its structures was,



Plan of Fort Spokane.

for the most part, based on standard specifications for military structures issued by the government in 1882. As was typical of military installations constructed during this era, there was a strong element of symmetry in the design and axial layout of the grounds. There was also a strong physical and symbolic hierarchy in the functional organization of the complex.

The troops were housed in six two-story, wood-frame barracks, all of which were completed by 1884. The men slept in dormitories on the upper floor, while the main floor of each structure provided room, for a kitchen, mess hall, reading room and social area. Located just behind and south of each barracks were individual company vegetable gardens. The soldiers took great pride in these garden plots, and the crops supplemented the larger post garden behind the stable and produce brought in by supply wagon. Because the size of the garrison fluctuated over the years (between 300 men at its peak in 1886 to fewer than twenty in 1899) there were periods when some barracks buildings were not used for housing but served well as the post exchange library and Saturday night dance hall.

The soldiers at Fort Spokane engaged in an intense schedule of drills, roll calls, formal parade, and patrol duty. This rigorous routine was the result of a general reform in army discipline and policies during this era. It was the judgement of the military that a garrison in peace required a mechanical sense of duty. Only in that context would each soldier know his place if called into battle.

view of the fort ca. 1890, showing three of the six barracks, the parade grounds, officers' row and the main entry road.

A large parade ground fronted the row of barracks. Used for daily drills, roll calls, marching, and formal parade, the ground was open and "relatively green" with tufts of bunch grass lending some relief from the enormous amounts of dust created by the fine, light soils of the area. The parade grounds were encircled and bisected by an elevated boardwalk framing the ground plan and making a formal edge.

On the northwest side of the parade grounds, across from the barracks, a series of two-story wood-frame houses made up officers' row. Most of the officers lived in duplexes or double quarters and higher ranking officers lived in single houses. Symbolically and physically in the center of officers' row, was the commanding officer's house. Altogether there were ten houses delineating the northwest edge of the complex. Structures along officers' row had a front porch extending across its main facade and most had a back stairway which led to a woodshed and laundry. At one time, every house also had a picket fence around the perimeter of the yard, and occasionally the fence extended into the side yards. The grounds around the officer's quarters were quite ornamental and

The commanding officer's house and garden, looking north.

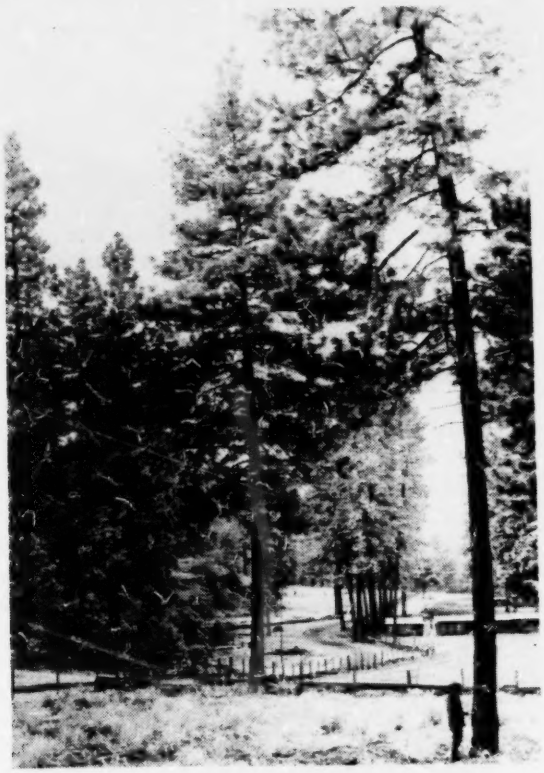
florally lush in contrast to the surrounding landscape. Yards were embellished with locust trees and a variety of herbacious plants including helieotrope, roses, marigolds, honeysuckle, and verbena. Lawns with "the sweet perfume of clover" were kept green with water pumped from the reservoir. A font was placed along the boardwalk directly in front of the commanding officer's residence accentuating the formal nature of the military structure and providing a rather elegant feature. Indeed, the overall impression of these gardens and structures, especially in contrast to the dry and sparsely inhabited surroundings, added a great deal of cultural presence, community, and domesticity to a seemingly remote territory.

Directly south of the commanding officer's house, across the parade grounds and centered in the entire fort complex, was the administration building (1880s). Functionally the headquarters for the post, this structure was the center for virtually all business and activity. A stately two-story building with a glass-sided cupola, this structure and the commanding officer's house echoed each other and created the primary axis, dividing the site into a series of quadrants. Just east of the administration building was one of only a few brick structures at the fort--the guardhouse (1892). This was the second guardhouse built on the post. The first was located south of the administration building.

The historic guardhouse is used as a NPS visitor center. The administration building was to the left of the guardhouse in this picture.

Along the north edge of the post, a chapel (1885) and hospital (1883) as well as a series of smaller structures, provided a sense of spiritual comfort and structural enclosure along that edge of the post. In contrast, there were no structures along the southwest edge of the parade grounds and the open expanse allowed the eye to drift far past the plateau, to the river and beyond the fort's contrived boundaries.

In addition to these structures and their very formal siting and orientation, the fort had another cluster of service-oriented buildings located south of the barracks. This area of the fort possessed a distinctly different character than the northern portion. Not only were the buildings arranged more according to function than social order, but the spatial organization, including circulation paths, land uses, vegetation, and building clusters reflected the active working nature of the area. In general, the grounds were not as open with ponderosa pine spilling from the eastern ridge onto the grounds (nearly two hundred feet in places) providing a shady, more protected and less formal ground plane.



Wagon road along the edge of the eastern ridge, looking south.

Structures behind the barracks, looking southwest.

With surrounding forests yielding abundant material, a steam-operated sawmill supplied framing lumber for nearly all the buildings on the grounds. This sawmill (ca. 1880) was destroyed by fire in 1884, and a second was rebuilt by the Army near the original location.

Also along the east ridge an ice house (1882) provided for the year around storage of goods. Soldiers gathered ice seasonally from the river and carried it up the river bench to pack inside the thick walls of the structure.

Between the ice house and the sawmill were a cluster of workshops and storge facilities. One large building housed a carpenter, a blacksmith, and wheelwright, all providing the means for keeping horses shod and supply wagons in working order. Also in this cluster was a granary and brick quartermaster storage structure (1889). Here supplies of leather, cement, charcoal, and other goods were stored. Other dry goods for the fort were kept in the commissary storehouse (1887) near the administration building and close to

The workshop at the fort, including this large structure for the blacksmith, carperter and wheelwright helped make Fort Spokane self-sufficient. View from the East.

the post bakery and barracks kitchens. One other brick building along the northern edge of the site, the powder magazine (1888), was used for the storage of guns and ammunition.

Two large stables were also located in the southern portion of the fort. A rather grand quartermaster stable (1884) housed the mules which were used to pack and pull supply and hay wagons from the fort to the outlying market centers of Davenport, Lincoln, Peach, and Sprague. The stable contained a harness room and grain room, and was large enough to board 58 mules and store a hundred tons of hay. Near this building, a much smaller shelter provided room for sixteen additional mules. A very large corral provided an additional holding area and secure pasture. The wagon shed was logically sited between the quartermaster stable and the main entry road assuring easy hookup and circulation. The other major stable was the cavalry stable (1887). A one-story wood frame structure, behind the west row of barracks, 200 X 30 feet with stalls for the horses, a saddle room, and storeroom.

Altogether the complex of Fort Spokane included 45 permanent structures. Other buildings such as storage structures or trader's huts, were erected and removed over time as needs at the post changed. Several of the major original buildings underwent various changes and adaptive uses as the size of the garrison fluctuated over the years. Never the less, the primary spatial organization of the complex remained intact for fifty years.

OTHER STRUCTURES

A relatively sophisticated water system evolved at Fort Spokane over the years. Initially the fort was supplied with water from a spring on the south ridge above the complex. From the spring, water was conducted by pipe to a reservoir built in 1883. This structure had a capacity of 1900 barrels and was sited near the main spring approximately 350 feet above the level of the parade grounds. From the reservoir, water was piped down to the post and distributed to the buildings. As the post grew in the late 1880s this water supply proved inadequate and a larger and somewhat more elaborate system was installed.

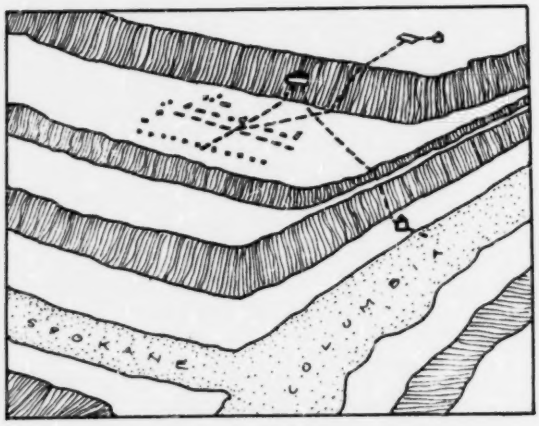


Diagram showing the two water systems developed by the military.

The new system included a powerful steam-pump and boiler set up on the bank of the Spokane River. From there, water was carried in four-inch pipes to the new reservoir (1889), some 3500 feet distant, and 100 feet above the parade ground. The reservoir walls were stone and brick with concrete laid over the stone foundation giving the new structure nearly four times the holding capacity of the original reservoir. Water was redistributed throughout the complex.

The military did not altogether abandon the initial spring water system. It continued to provide fresh water for cooking and drinking while the new system provided water for the garden, the boiler, the wash-houses, and livestock.

As was typical of other military posts, Fort Spokane was bordered and enclosed for the most part by a fence. Accounts of the one along the northeastern edge of the complex indicate it was a tall wood and wire fence (6-8 feet) and had a substantial gate in the middle at the main entry point to the entire complex. The gate itself was a large swing structure, quite heavy, that opened and closed by a rope attached to a pulley. A smaller shelter beside the gate provided cover for a sentry who was posted there at all times. Several sources indicate the fence was also lighted at night.

Another fence followed the southern edge of the complex. By all accounts it also was quite tall (approximately 8 feet) and made of wood post and wire. Documentation refers to a third major fence along the southwestern edge of the site with another, less impressive, gate at the southeast corner, restricting access to and from the fort. Completing the enclosure, a wire and wood fence edged the rear yards of the officers' quarters helping define the northwest corner of the complex. Other fences, including the corral behind the quartermaster stable and smaller fences along portions of the entry by the post hospital were all constructed of wood.

In the late 1890s lamps were located

in front of the houses, barracks, and other important buildings as well as along the northeast fence (see above). These lamps burned kerosene and were lit by camp prisoners each evening.

Fire hydrants were located throughout the post and were hooked up to the spring water reservoir because of the powerful pressure as the water came off the bluff.

The post cemetery was approximately a mile north of the complex. Before the Fort was officially abandoned by the military in 1899, the remains of thirty-five army personnel were exhumed and moved to other military cemeteries.

ROADS AND ACCESS

A stage served the fort daily from Davenport (25 miles south) where connections could be made with the Northern Pacific Railroad. Supply wagons delivering goods to the post entered through a main gate on the east side of the complex and followed a circuitous road around the perimeter of the complex. Secondary access points in the northwest and southwest corners of the complex served the internal workings of the fort.

Internal circulation on a smaller scale included a number of simple footpaths and a raised boardwalk. The boardwalk ran in a straight line along the front of the barracks and officers' row. It connected along the west and east edges of the complex, as well as through the center of the parade grounds, linking the Commander's house and headquarters.

SOCIAL AND PERCEPTUAL CONTEXTS

By all accounts, the post was known for the natural beauty and "healthful" environment of the surrounding landscape. The climate was moderate and the fort was far away from whatever ills major population centers might contrive. N.H. Hubbard, post surgeon, noted in 1893:

> The isolation of the post is almost complete, the feeling of loneliness or perhaps the feeling of stillness is sometimes oppressive; very similar to that experienced on the cessation of hostilities after prolonged battle between two large contending armies.

Vistas on either side of the post opened onto vast expanses of uninhabited terrain, extending hundreds of miles. Consequently, with the exception of some services and traders located adjacent to the fort, there were few off-post recreational options for off-duty soldiers. Many drank and played cards at Bochemuchl's Brewery and Malt House or "Virginia Bill" Covington's place down the road.

Other activities included horseback riding, wrestling matches, horse racing, horseshoes, hunting, and fishing along the river. Perhaps the soldiers' favorite passtime was baseball. It became a popular sport at the post in the 1890s with each company comprising a team and playing each other or neighboring community teams as far away as Spokane.

By the late 1880s the social life at the post picked up as travelling minstrel shows and local theater companies performed frequently. In many ways the fort itself became a focal point for the surrounding community, hosting a variety of events, including "frequent and

elegant teas," receptions and lawn parties. Major festivities centered around the fourth of July, with dancing, contests, entertainment, food and fiddle music.

Women living on the post spent their time taking care of children and tending to the variety of tasks and chores associated with the smooth running of any household. Their free time was spent gardening, horseback riding, hiking, playing tennis, and attending social functions. Children on the post attended school in the chapel and found recreation watching the soldiers and playing down by the river.

The river was a favorite recreation area.

By the late 1890s, any possibility of an Indian/Settler "problem" had disappeared under the waves of white settlement. With the outbreak of the Spanish-American War in 1898, the remaining troops at Fort Spokane were sent to fight in Cuba. While some white settlers and residents of the area were unhappy with the removal of troops from the fort, the Indian Agency had a somewhat different view. As the War Department made plans to transfer jurisdiction of Fort Spokane to the Department of the Interior, the Indian Agency began making plans for reuse of the abandoned facility.

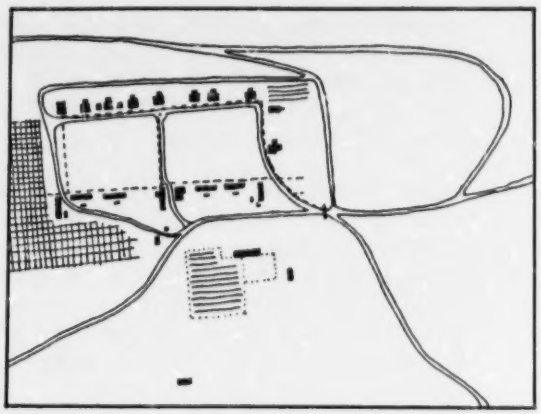
HISTORICAL CONTEXT 1900 - 1930

At the turn of the century the federal government maintained several types of schools for the education of Indian children, including reservation day schools, and non-reservation training or boarding schools. The primary government policy in administering these schools throughout the country focused on acculturation. Indians on the reservation were encouraged to "blend into" white culture by wearing Anglo-American clothes, cutting off their braids, living in permanent homes, and adopting Anglo-American farming techniques. Formal education was to be the primary tool for the making over of Indians into members of the wider American community (Gridley, 1979). As early as 1897 the Indian Agency's need for a boarding school on or near the Colville Indian Reservation was apparent. Although a day school was already in operation on the reservation in Nespelem, by 1901 the school was considered inadequate. In the eyes of many, the former military post, Fort Spokane, provided the ideal facility. As the new agency school superintendent wrote in 1903:

> The location is an ideal one for school purposes...the buildings are old and are not exactly such that would be built for school purposes, but there are enough of them, which is a matter of primary importance, and, on the

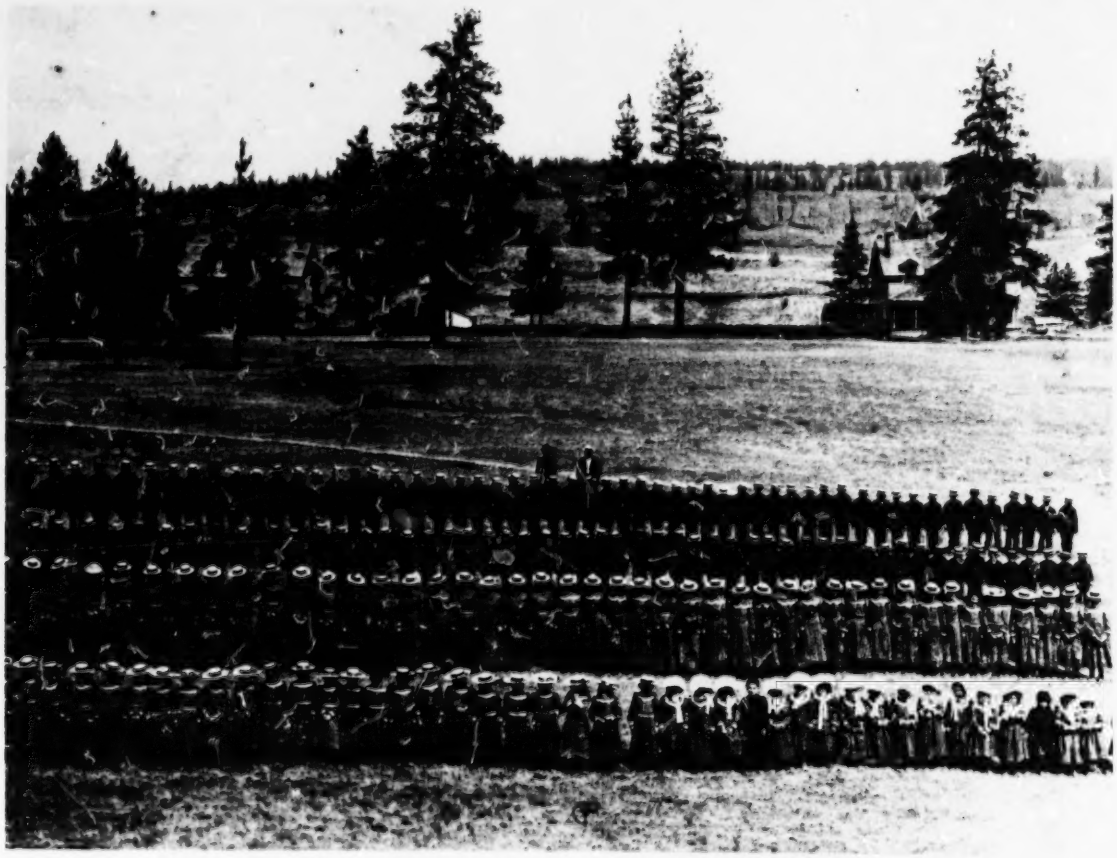
whole, the plant is practically far superior to many which are new and built on modern lines(HRS 1980).

Indeed the structural complex of Fort Spokane provided ample space for the agency's headquarters, housing for nearly three hundred students and various school employees, an excellent water system, and significantly, plenty of open space for the agricultural, industrial, and domestic education of the Indian children. On April 2, 1900, the school officially opened its doors.



STRUCTURAL COMPLEX AND LAND USE

It is interesting and not by accident that many of the functions and adapted uses of the buildings at the fort, as well as many of the daily routines practiced by the agency in administering the new school, echoed the military uses and regimentation which preceeded them.



Attendance at the school fluctuated over the years it was in operation from over 200 when it opened to under 30 in its closing years. The school staff living on the site included the superintendent, several clerks, a seamstress, a cook, a baker, laundress, farmer, carpenter, industrial teacher, and classroom teacher.

The superintendent of the school lived in the former commanding officer's house and six of the remaining houses along officer's row were occupied by agency and school employees. One residence housed a physician and dispensary, and the large house on the west end of the row (building #10) housed older girls attending the school. Two of the original houses in officer's row were destroyed by fire during this period.

Former officer's residences were used to house school staff.

The former headquarters buildings, still at the heart of the complex, contained the school administrative offices, assembly hall, storeroom, and sleeping quarters for older boys attending the school. The six

The administration building during the Indian agency period.

barracks on either side of the administration building were used in a variety of ways. Initially the three buildings to the east housed support facilities for the school and included a gym, a hospital, and a school house where classroom instruction was given daily. Two of the barracks, west of the adminstration building, were used as the young girl's house and young boy's house. The other barrack building became the primary kitchen facility and dining room for the entire school. Finally, the brick guardhouse north of the administration building was adapted and used as a bath house and sewing room.

Although these buildings were the primary structures used by the Indian Agency, several other buildings in the southern portion of the complex were also adapted from the military period and used. The former brick quartermaster storehouse was used occasionally as a jail and detention facility for the Indian children. The bakery continued to be used as a bakery and part of the school curriculum for

the boys included some instruction with the head baker.

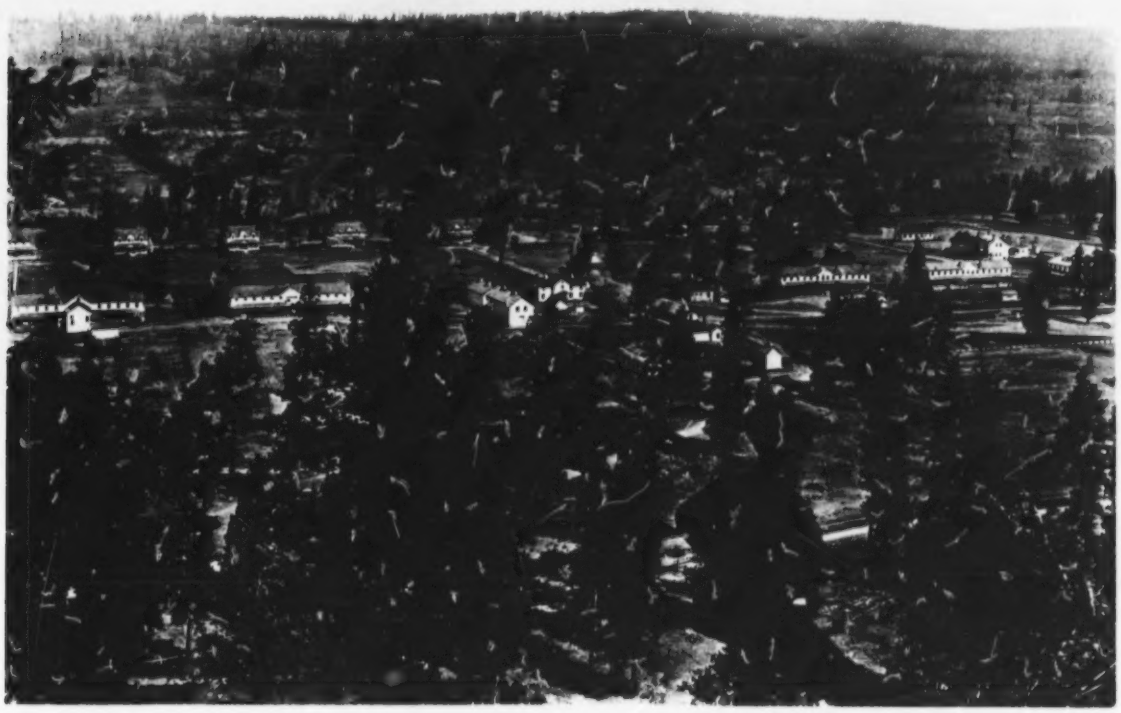
Other buildings, including the quartermaster stable, cavalry stable, shops, and a few other minor structures were used in the instruction and industrial training of students and as storage facilities for agriculture equipment and other supplies. The former post hospital from the military period became the headquarters building for the Colville Indian Agency.

This spatial organization, with students clustered along the central axis of the post, staff and employees along the north, administration at the center of the entire complex, and other facilities to the east, remained for several years.

Functionally the Indian Agency school was able to adapt successfully at least one-half of the forty-five existing buildings of the former military post to suit their needs. As was the case during the military occupancy, several structures were physically altered and functionally adapted. On the whole, however, the primary physical complex remained remarkably intact.

One of the most significant additions to the fort complex during this era was the large fruit orchard, vegetable garden, and other vegetation planted by the students as part of the agricultural teachings of the school.

On the south and southeast quadrants of the grounds, approximately 700 fruit trees were planted on a grid



View of the site during the agency school period, looking north. The young orchard is visible in the middle of the photograph.

School vegetable garden southeast of the administration building. A portion of the orchard is pictured in the foreground, ca. 1908.

that elbowed around the edge of the complex. In addition, a substantial vegetable garden produced roughly 275 bushels of potatoes and associated garden produce. Not all new plantings were profit-oriented as the agency also planted a row of box elders (Acer negundo) along the boardwalk in front of the former barracks buildings. Fences around the old quartermaster stable appear to have been maintained during this time, as were portions of the fence that enclosed the original complex.

While the physcial complex of the former fort was adequate, a number of problems faced the agency, not the least of which was the increasing number of day schools appearing on the reservation itself. Parents were naturally reluctant to send their children away to school when the children could attend school near home. Attendance figures at the boarding school dropped steadily over the years until there were only forty-one students enrolled in 1907. This decline, coupled with the high cost of maintaining the physical complex of the old fort, forced the agency to close the school in 1908.

For the next two years, the agency maintained a hospital at the fort for children with respiratory diseases. The facility was quite successful and drew children from reservations throughout the western United States. Despite the need for such a service, the physical plant of the site again proved too costly to maintain, and the hospital was shut down in 1910.

After the hospital closed, the Colville Indian Agency headquarters remained at Fort Spokane until 1913. In that year adminstrative responsibilities officially moved to the Colville Reservation. Although their administrative headquarters were now located on the Colville Reservation, the Indian Agency continued to advocate a hospital at the old fort, serving both the Colville and Spokane Reservations. When the Agency opened the hospital in 1918 the facility occupied several existing structures, and added two residences.

The primary hospital facility was housed in the western-most structure along officers' row (residence no. 10). The building was adapted from a duplex residence to include an operating room, a record room, reception room and small dining room, and a dormitory for the patients. The doctor in charge lived in the former military commander/school superintendent's residence, and his staff lived in two new structures built during this time. These two structures were simple bungalows sited between the foundations of former officers' houses. The new residents of these houses felt a sense of permanance and embellished the landscape surrounding their homes with locust trees and clematis.

During this era, most of the structures at the fort were dismantled, or relocated, including some of the buildings along officers' row and the cavalry stable.

While the hospital helped many children over the years, the distance of the facility from the reservation and mounting costs of structural maintenance were excessive and for the final time, the Indian Agency shut down its operation at Fort Spokane, leaving the site for good in 1929.

HISTORICAL CONTEXT 1930 - PRESENT

Between the years 1930 and 1960, Fort Spokane lay for the most part vacant and neglected. Most of the remaining structures were removed and the orchard, gardens, and fences were abandoned to slow decay. Over the years the community and local farmers often used open areas of the fort for pasture and cultivating crops.

In the 1930's, during construction of Grand Coulee Dam, Works Progress Administration (WPA) work camps were located along lands and districts to be inundated by the backwaters of the new dam. One major camp, Camp Lincoln, was located at the confluence of the Spokane and Columbia Rivers. Much clearing undertaken by these crews involved not only the removal of vegetation and existing roads, but entire towns. With completion of Grand Coulee Dam in 1942, and the creation of Lake Roosevelt, the waters directly below Fort Spokane rose over a hundred feet, reducing significantly the number of benches between the complex and the river, and enhancing recreational opportunities.

In 1960, jurisdiction of Fort Spokane was transferred to the National Park Service as part of the newly-formed Coulee Dam National Recreation Area. Over the years several campgrounds have been established along the lake and Spokane River, including one just below the fort. The Park Service maintains Fort Spokane today as a historic site, adding an interpretive walk and a district ranger station to accommodate the increasing number of visitors.

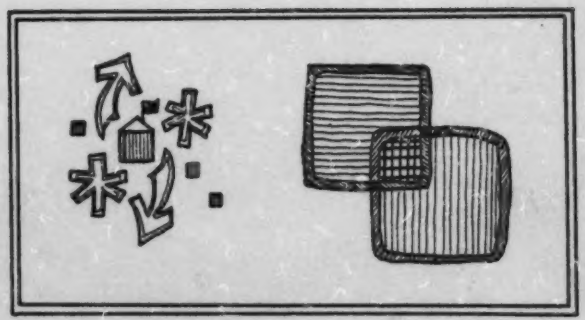
SUMMARY

From this overview it is evident that the history of Fort Spokane can be thought of as having four distinct periods: the military period from 1880 to 1889 when the primary structural complex of the fort was built; the Indian Agency period from 1900 to 1929 when many of the original structures were adapted and reused as a school, hospital and administrative headquarters for the Colville Indians; a thirty year period from 1930 to 1960 when the complex was for the most part neglected and many of the original buildings were lost; and finally, the years from 1960 to the present, when the National Park Service assumed jurisdiction of Fort Spokane as part of Coulee Dam National Recreation Area.

Fort Spokane ca. 1940, showing the northwest corner of the site. The guardhouse is at the far right and the Indian Agency hospital is near the center of the photograph.

The northeast corner of the site, showing the quartermaster stable, guardhouse, storehouse and officers' quarters, ca. 1940.

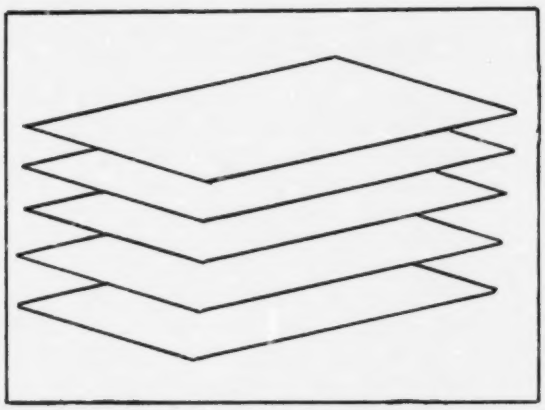
ANALYSIS AND EVALUATION



ANALYSIS AND EVALUATION

During the fourth week of the project, all historic data and base information was cataloged and mapped. In addition to the existing conditions data (compiled during the field survey), a series of maps and sketches emphasizing the contemporary perceptual and functional aspects of the site were developed at a variety of scales. Types of issues explored included an analysis of vehicular and circulation patterns, visual qualities, perceptual site boundaries, land use concepts, and micro-climate. For example as part of this analysis an intensive overview of the NPS maintenance facility and employee housing (located on the historic site) was conducted. Various maintenance needs, including machinery and equipment storage, vehicular access, proximity to adjacent campgrounds, facility security, visual impacts, cyclic program requirements, and staffing were considered in relation to historic site integrity. From this process, it was found that the current service road providing access to the maintenance facility as well as the structures themselves seriously compromises and jeopardizes the design integrity of offices' row itself. In addition, the service road cuts between foundations, essentially isolating several foundations from the rest of the historic site. Based on a synthesis and evaluation of critical historic components (see below), it was determined that the facilities and service roads should be removed from the historic site proper. Several alternative locations within the historic zone were considered and after the material was reviewed the opportunities and constraints of each location, the best site for relocation was determined.

In addition to the contemporary site analysis, base maps depicting the site during each primary historic period were compiled. These maps graphically illustrated major land uses, building functions, site features, details, and overall landscape organization. These maps were then combined in a series of map overlays, leading to an evaluation of historic landscape components. Components such as building sites and functions, site boundaries, plant materials, circulation patterns, and general land use that imbricate through



"Layering" historic base maps is a technique used for evaluating significant landscape patterns and features.

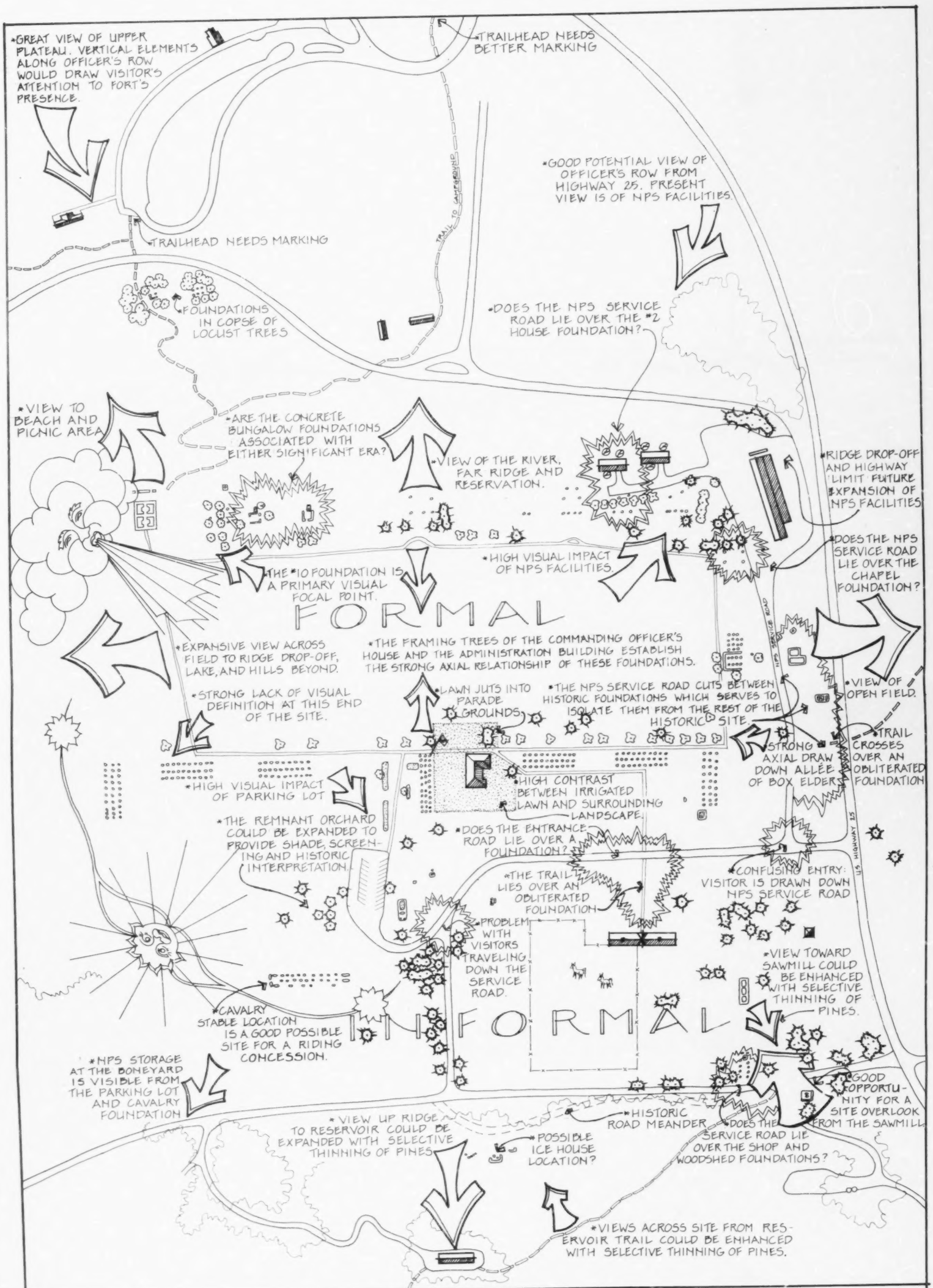
successive historic eras carry greater historic significance because they exhibit continuity of use. This concept itself, continuity of use, along with overall land use, spatial organization, and material components are critical factors in determining the significance of landscapes associated with more than one historic date or period. The technique (of layering historic eras) also supports the context of the site as a whole system. Fort

Spokane, for example, is a complex of inter-related systems (buildings, roads, paths, fences, pasture, vegetation, etc.), that together define this historic site. The boardwalk alone, or the guardhouse as a single building, cannot define or convey a historic character or sense of place. Furthermore, when the existing conditions map was combined with the historic synthesis it was determined that many of the features and remnants remaining on the site from the historic periods displayed a great deal of spatial integrity. From this overlaying process and evaluation, a fundamental design vocabulary for the historic landscape of Fort Spokane was developed.

FINDINGS: HISTORIC SYNTHESIS

Of the 45 primary structures built by the military, 23 were adaptively reused by the Indian Agency during its thirty-year occupancy of Fort Spokane. These buildings were determined to be of primary historic significance. In addition the original circulation systems, the entry gate, wagon road and boardwalk remained in use. Broad land use patterns were also maintained.

Recreational use patterns and access along the river, several off-site connections, as well as the administrative and functional uses of the structures carried through both historic periods and are evident today. A variety of site features and detail elements were adapted or reused. Although some fences constructed by the military were removed by the Indian Agency, others were added. Both maintained the wood and wire fence surrounding the complex and the fences behind the quartermaster stable. The water system developed by the military was also used by the Agency for irrigating their orchard and vegetable gardens. Perhaps most significant, the primary spatial organizations--building clusters, open spaces and access--and land uses, remained intact over a fifty-year period. The physical complex of the fort was successfully adapted to suit the needs and functional uses of two cultures with very different purposes. Although little of the material fabric remains on the site today, these primary landscape patterns are discernable and contribute to the overall site integrity.


*GREAT VIEW OF UPPER PLATEAU. VERTICAL ELEMENTS ALONG OFFICER'S ROW WOULD DRAW VISITOR'S ATTENTION TO FORT'S PRESENCE.
*TRAILHEAD NEEDS BETTER MARKING
*TRAILHEAD NEEDS MARKING
TRAIL TO CAMPGROUND
*GOOD POTENTIAL VIEW OF OFFICER'S ROW FROM HIGHWAY 25. PRESENT VIEW IS OF NPS FACILITIES.
*FOUNDATIONS IN COPSE OF LOCUST TREES
*DOES THE NPS SERVICE ROAD LIE OVER THE #2 HOUSE FOUNDATION?
*VIEW TO BEACH AND PICNIC AREA
*ARE THE CONCRETE BUNGALOW FOUNDATIONS ASSOCIATED WITH EITHER SIGNIFICANT ERA?
*VIEW OF THE RIVER, FAR RIDGE AND RESERVATION.
*RIDGE DROP-OFF AND HIGHWAY LIMIT FUTURE EXPANSION OF NPS FACILITIES
*HIGH VISUAL IMPACT OF NPS FACILITIES.
*DOES THE NPS SERVICE ROAD LIE OVER THE CHAPEL FOUNDATION?
*THE #10 FOUNDATION IS A PRIMARY VISUAL FOCAL POINT.
FORMAL
*EXPANSIVE VIEW ACROSS FIELD TO RIDGE DROP-OFF, LAKE, AND HILLS BEYOND.
*THE FRAMING TREES OF THE COMMANDING OFFICER'S HOUSE AND THE ADMINISTRATION BUILDING ESTABLISH THE STRONG AXIAL RELATIONSHIP OF THESE FOUNDATIONS.
*STRONG LACK OF VISUAL DEFINITION AT THIS END OF THE SITE.
*LAWN JUTS INTO PARADE GROUNDS
*THE NPS SERVICE ROAD CUTS BETWEEN HISTORIC FOUNDATIONS WHICH SERVES TO ISOLATE THEM FROM THE REST OF THE HISTORIC SITE
*VIEW OF OPEN FIELD.
*TRAIL CROSSES OVER AN OBLITERATED FOUNDATION
STRONG AXIAL DRAW DOWN ALLÉE OF BOX ELDER
*HIGH VISUAL IMPACT OF PARKING LOT
*HIGH CONTRAST BETWEEN IRRIGATED LAWN AND SURROUNDING LANDSCAPE.
*THE REMNANT ORCHARD COULD BE EXPANDED TO PROVIDE SHADE, SCREENING AND HISTORIC INTERPRETATION.
*DOES THE ENTRANCE ROAD LIE OVER A FOUNDATION?
*THE TRAIL LIES OVER AN OBLITERATED FOUNDATION
*CONFUSING ENTRY: VISITOR IS DRAWN DOWN NPS SERVICE ROAD
*PROBLEM WITH VISITORS TRAVELING DOWN THE SERVICE ROAD.
*VIEW TOWARD SAWMILL COULD BE ENHANCED WITH SELECTIVE THINNING OF PINES.
*CAVALRY STABLE LOCATION IS A GOOD POSSIBLE SITE FOR A RIDING CONCESSION.
FORMAL
*NPS STORAGE AT THE BONEYARD IS VISIBLE FROM THE PARKING LOT AND CAVALRY FOUNDATION
*GOOD OPPORTUNITY FOR A SITE OVERLOOK FROM THE SAWMILL
*VIEW UP RIDGE TO RESERVOIR COULD BE EXPANDED WITH SELECTIVE THINNING OF PINES.
*HISTORIC ROAD MEANDER
*DOES THE SERVICE ROAD LIE OVER THE SHOP AND WOODSHED FOUNDATIONS?
*POSSIBLE ICE HOUSE LOCATION?
*VIEWS ACROSS SITE FROM RESERVOIR TRAIL COULD BE ENHANCED WITH SELECTIVE THINNING OF PINES.
NPS SERVICE ROAD
US HIGHWAY 25

FORT SPOKANE—SITE ANALYSIS—

COULEE DAM NATIONAL RECREATION AREA

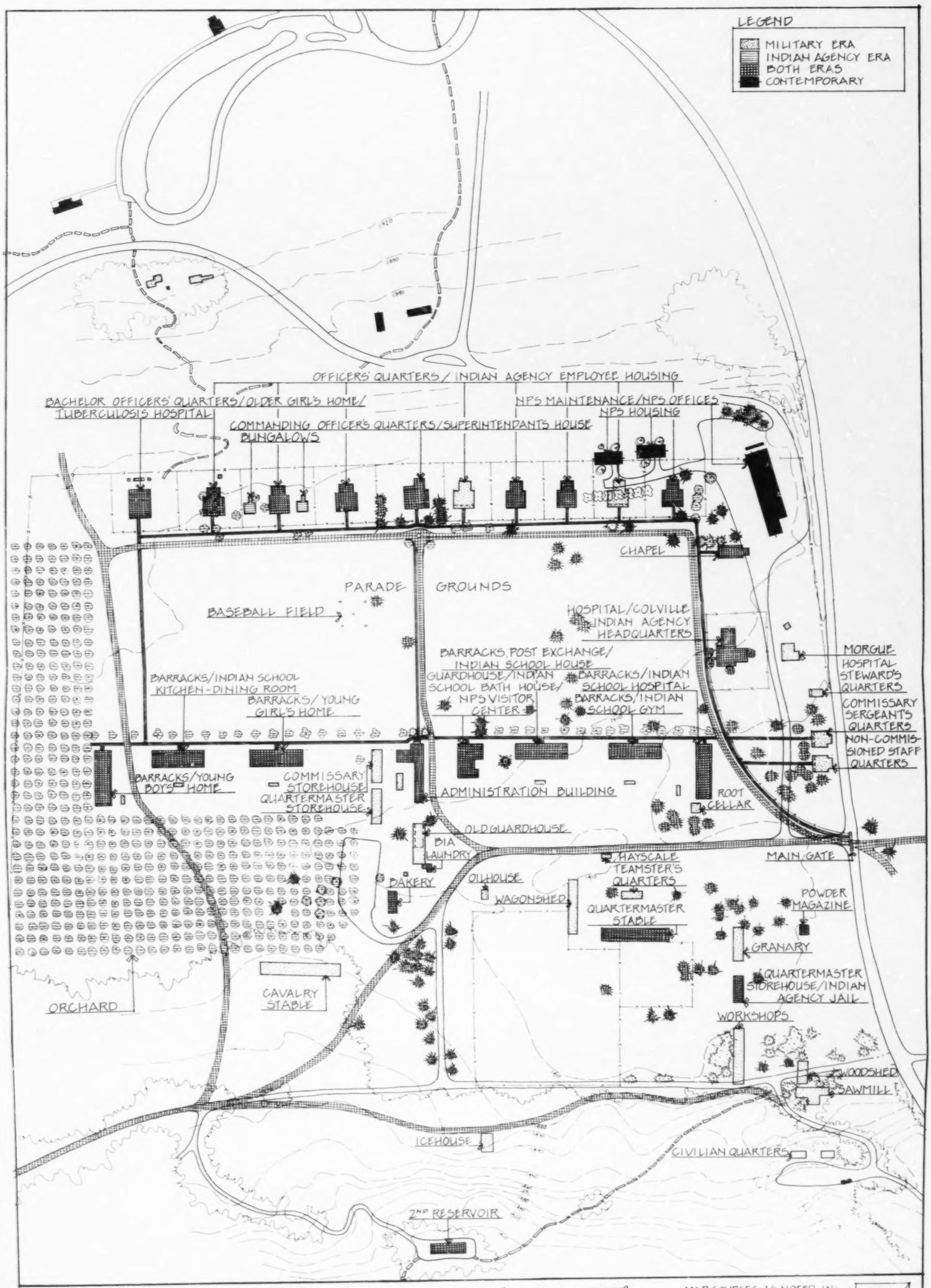
NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

NORTH

100 50 0 100
SCALE : 1" = 100'-0"

·MAP SOURCES AS NOTED IN THE HISTORIC LANDSCAPE OF FORT SPOKANE: A DESIGN PROPOSAL
·COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985
DRAWN BY NIEDZWIECKA · SEPTEMBER 1985

SHEET 3 OF 7



FORT SPOKANE — HISTORIC SYNTHESIS —

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

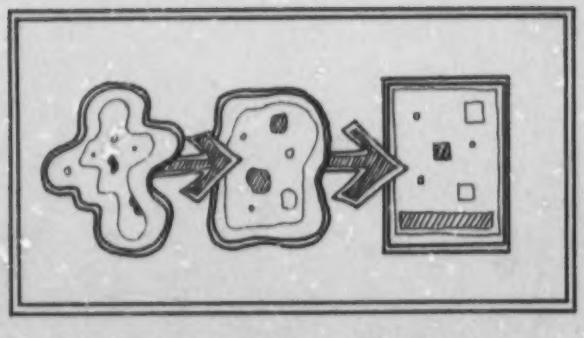
NORTH

SCALE: 1" = 100'-0"

MAP SOURCES AS NOTED IN: THE HISTORIC LANDSCAPE OF FORT SPOKANE, A DESIGN PROPOSAL.
COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985
DRAWN BY NIEDZWIECKA SEPTEMBER 1985

SHEET 4 OF 7

DESIGN DEVELOPMENT



DESIGN DEVELOPMENT

The proposed master plan reflects aspects of the research findings and site analysis as well as all significant historic landscape components critical for enhancing the readability and coherent character of the historic landscape of Fort Spokane. The plan graphically depicts the layout and arrangement of critical features to be reestablished on the site. The design as a whole focuses on reestablishing significant overall patterns rather than isolated components. As discussed in the evaluation section, while individual elements are significant, their value lies primarily in the relationships they create, and in their ability to communicate the historic landscape as a whole.

Two major program elements were specifically addressed in development of the master plan:

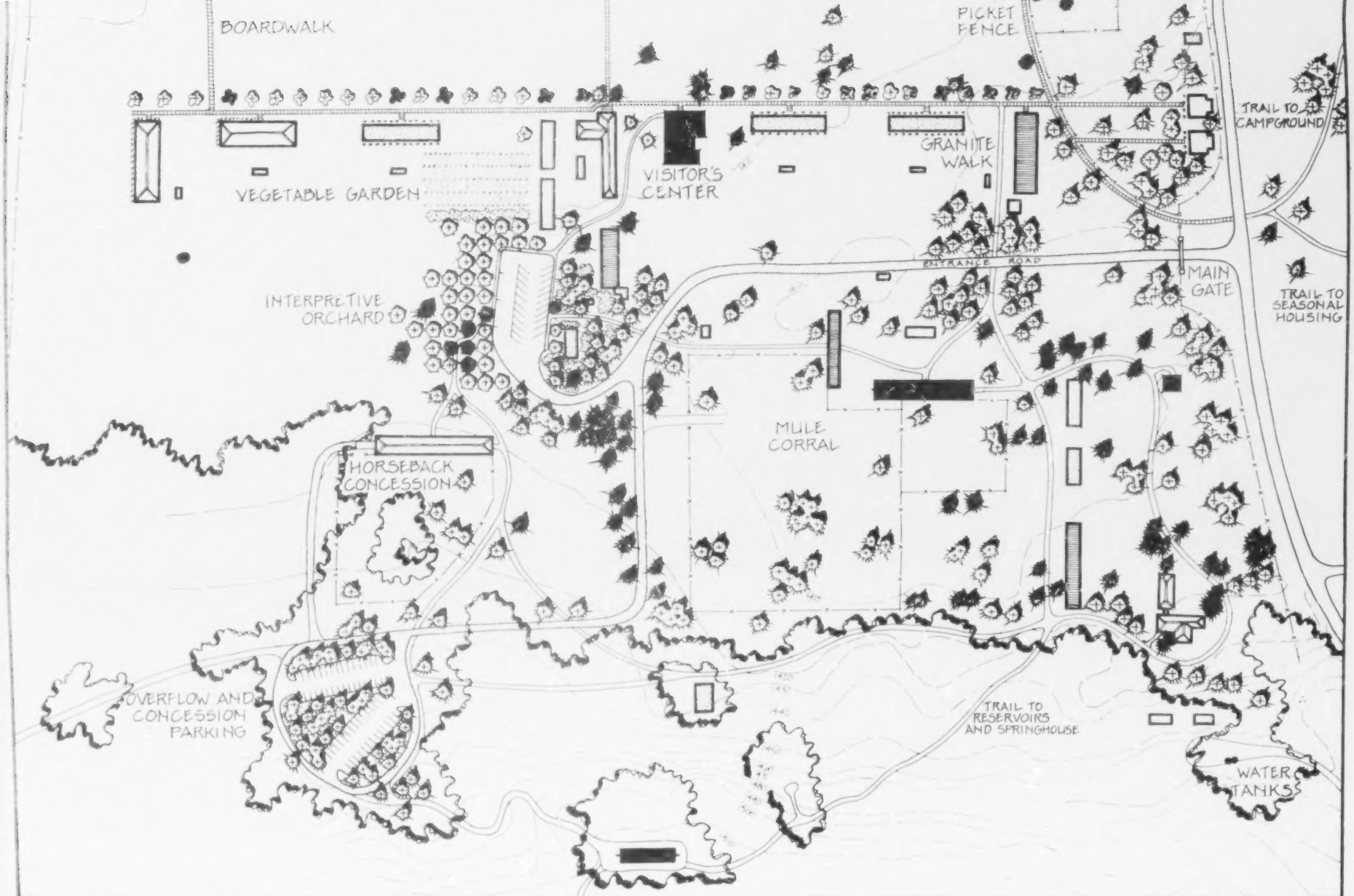
1) Expanding interpretive opportunities at the site through enhancement of historically significant features, and

2) Expanding the potential for contemporary uses on the site while preserving historic landscape integrity.

These program elements were achieved in four ways. First the boundaries of the site were expanded to include areas adjacent to the fort complex used (historically) by the military and Indian Agency; secondly, all historically significant features identified in the evaluation were located and redelineated on the ground plane; thirdly, all contemporary elements which compromised the historic integrity of the site were removed; finally and as appropriate, new features and contemporary uses were added to the site which mirrored or enhanced historic site uses.

In order to assume as much design flexibility as possible, a phasing plan was developed and is included below as a planning tool for implementation of the master plan. A list of recommendations accompany the plan. They are grouped to address both general and specific site considerations including buildings and foundations, circulation, plant materials, and other design features. The recommendations are not prioritized but serve to supplement and verbally illustrate the Master Plan.

LEGEND
BOARDWALK
GATE
FENCE
OUTLINE
RAISED WALL
PLATFORM
GHOST
FOUNDATION TREATMENTS
EXISTING BUILDING
EXISTING TREE
PROPOSED TREE
TRAIL TO BEACH AND PICNIC AREA
TRAIL TO CAMPGROUND
SERVICE ROAD
SERVICE ROAD
PICKET FENCE
FONT
WIRE AND WOOD FENCE
BASEBALL FIELD
ST. AUGUSTINE HIGHWAY U.S. 25



FORT SPOKANE — MASTER PLAN —

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

NORTH

100 50 0 100
SCALE: 1" = 100'-0"

MAP SOURCES AS NOTED IN THE HISTORIC LANDSCAPE OF FORT SPOKANE: A DESIGN PROPOSAL COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985

DRAWN BY NIEDZWIECKA · SEPTEMBER 1985

SHEET 5 OF 7

RECOMMENDATIONS

BUILDINGS AND FOUNDATIONS

It is neither appropriate nor likely the park will reconstruct any of the historic buildings on the grounds of Fort Spokane. The location of these structures, however, is important to the visual coherence of the complex. Visually 'calling to mind' the amalgamation of buildings and their functions through design techniques will enhance visitor understanding of the site as a structural complex.

1. All four historic buildings on the site--the guardhouse, the quartermaster stable, the powder magazine, and the reservoir--should be maintained in accordance with the Historic Structure Preservation Guide, Fort Spokane, Washington (1983).

2. All non-historic structures, including the maintenance building complex and employee housing units, should be removed from the historic site.

3. The locations of all foundations and building sites indicated on the Master Plan should be verified by archeological investigation prior to any additional treatment.

4. All exposed foundations should be stabilized and maintained to the degree that no further deterioration occurs.

5. All foundations delineated on the master plan should receive treatment outlined in this report (see pg. 33).

6. New buildings and structures (not pertaining to the historic site and landscape design) should not be sited on the historic grounds.

CIRCULATION

Two kinds of circulation systems for the site are addressed in the design: vehicular access for maintenance, service and visitor traffic, and pedestrain circulation, including interpretive walks, walls, paths and trails. Both systems are designed to interact safely on the site and mirror historic circulation patterns.

VEHICULAR:

1. The existing vehicular access road from Highway 25 should remain the primary entry to the site.

2. Tne existing parking area southeast of the guardhouse should remain. Additional vegetative screening and staging areas around the parking lot should be added as delineated in the Master Plan and explained on pg. ' of this report.

3. The existing service roads to the National Park Service facilities along the base of the east ridge should be removed.

4. If new parking areas are required (e.g. concession parking) they should be small, appropriately screened and carefully sited in recommended locations.

5. General vehicular access, including service roads, should be restricted on the historic site. New service roads (as indicated on plan) should be located on the perimeter of the historic site and unpaved.

PEDESTRIAN

1. The interpretive trail, as outlined in the Master Plan, should be the primary pedestrian route throughout the site.

2. The historic boardwalk should be reestablished as indicated on the Master Plan.

3. Portions of the interpretive trail (not boardwalk) should be composed of crushed and compacted granite.

4. Additional or social footpaths on the grounds should be kept to a minimum in order to reduce unnecessary stress on vegetation.

PLANTINGS

A preliminary revegetation program has been developed for the historic site which focuses on the reestablishment of native grasses. Other plant materials (natural and introduced species) are used throughout the site for screening, creating spatial buffers, and directing circulation. A comprehensive planting plan and appropriate plant list for the site can be found on pg 47 . All materials used should be carefully selected and managed by appropriate park personnel.

1. Implementation of the grassland revegetation program should begin in 1986, and follow recommendations outlined in Evaluation and Recommendations for Reseeding Projects at Fort Spokane National Historic Site (see Appendix).

2. Allow and encourage the reestablishment of ponderosa pine (pinus ponderosa) particularly in the southern portion of the site as indicated on the Planting Plan.

3. The apple orchard should be partially reestablished (33 trees) and used for interpretive purposes and screening the parking lot.

4. The row of box elder (Acer negundo) along the boardwalk in front of the barracks should be reestablished. Many of these trees are in poor condition from previous years of neglect. Rather than stablize them, it is suggested that they be selectively replaced with young trees of the same species.

5. Ornamental gardens surrounding houses along officers' row should be reestablished (see RESEARCH and DETAIL recommendation sections).

6. Ornamental vines could be planted on proposed ghosted structures as evidenced in historic photo documentation.

7. Vegetable gardens could be reestablished as indicated on Planting Plan and used for interpretive purposes.

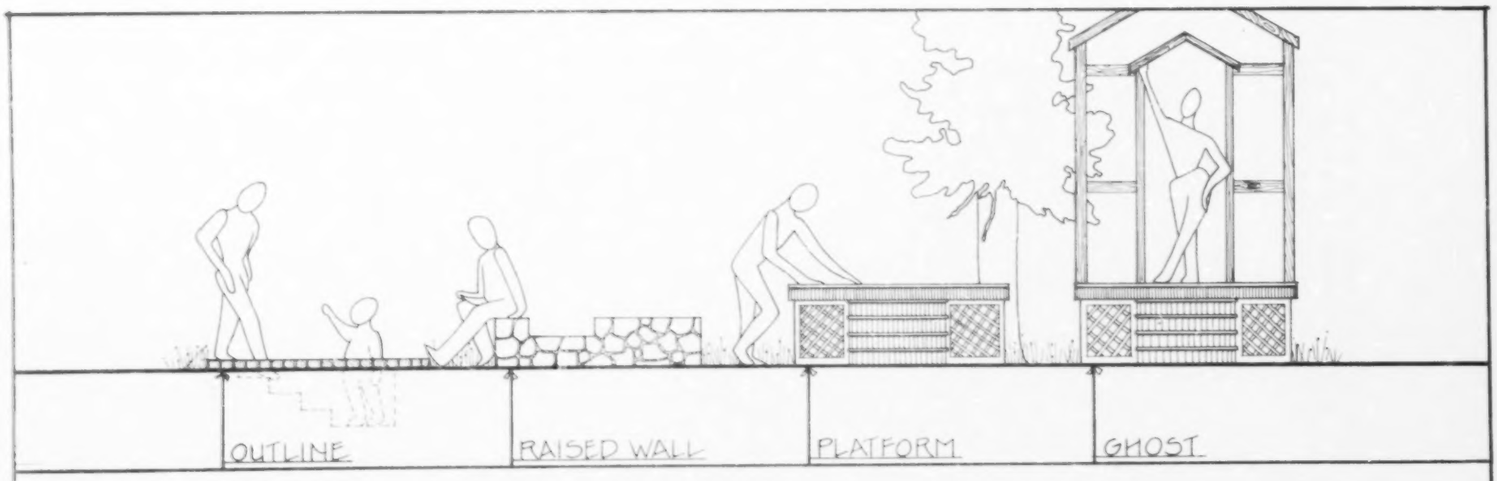
SITE DETAILS AND SPECIAL FEATURES

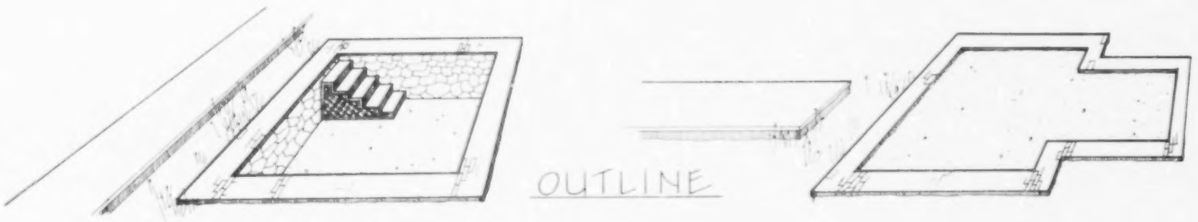
A number of site details are to be reestablished at the fort defining the historic boundary site, enhancing the overall visual richness and historic texture of the site. Interpretive elements and artistic features are also included at several scales, as design tools for "drawing-in" key components from each significant historic era, enhancing visitor experience.

FENCES AND GATES

1. The historic wood and wire fence surrounding the structural complex should be reestablished as indicated on the Master Plan.

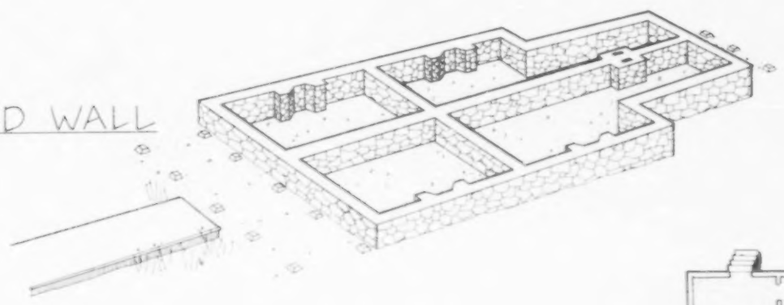
2. Low picket fences should be reestablished around the houses of officers' row, surrounding the hospital and following the boardwalk from the entry gate.



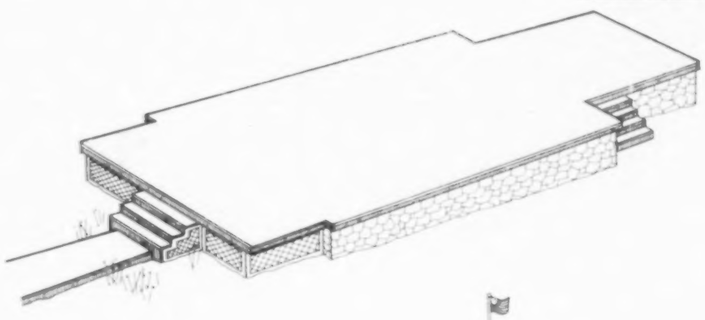


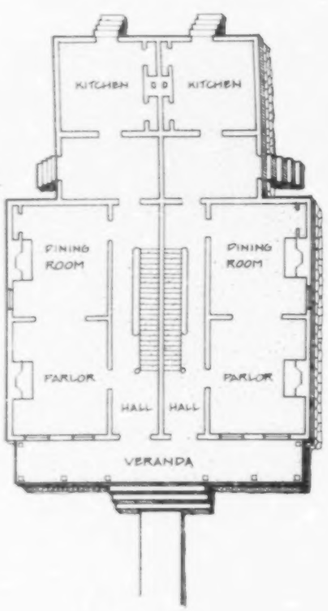
OUTLINE

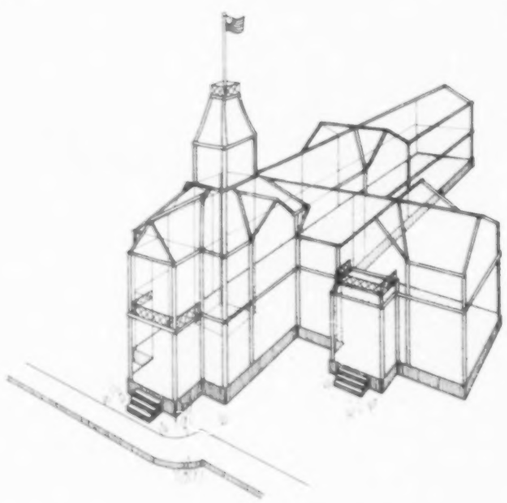
RAISED WALL



PLATFORM







GHOST

FORT SPOKANE—FOUNDATION TREATMENTS—

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

MAP SOURCES AS NOTED IN:
THE HISTORIC LANDSCAPE OF FORT SPOKANE - A DESIGN PROPOSAL
COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985
DRAWN BY NIEDZWIECKA · SEPTEMBER 1985

SHEET 6 OF 7

3. The existing wood fence corral east of the quartermaster stable should be expanded to its historic dimensions as indicated in the Master Plan.

4. The primary historic gate at the entry to the site should be reestablished as a focal point and 'gateway' to the historic site (see RESEARCH AREAS recommendations).

5. Four hinged gates along the boundary fence (as indicated on the Master Plan) provide limited access for service vehicles and additional pedestrian access to and from the campgrounds. These gates should be similar in material to proposed fencing (wood and wire).

OTHER FEATURES

1. Portions of the historic irrigation system including the spring house, original reservoir, exposed pipes along the ridge and hydrants on the grounds of Fort Spokane should be stablized and maintained as a complete system for interpretive and functional site uses.

2. The baseball diamond should be reestablished and used for interpretive and recreational purposes. No additional structures such as backstops or bleachers should be added to the site.

3. The font in front of the commanding officer's/superintendent's residence should be reestablished as focal point and staging area. (See pg. 37 ; RESEARCH AREAS recommendations)

MANAGEMENT CONCEPTS

1. Maintain the spatial integrity of the historic site by protecting existing ground patterns such as the open parade grounds, officers' row, the axis created by the box elders and informal plantings on the southeast portion of the site.

2. All modern intrusions such as above ground utility lines, contemporary structures (including boneyard), and elements that otherwise disrupt the historic scene should be removed from the historic site.

3. Reestablish and maintain all viewsheds in a manner that enhances perceptual awareness of the historic scene. No plantings or structures should obstruct views the site or inhibit views from the site to the historic zone. Selective clearing of vegetation as indicated on the Planting Plan is appropriate for framing views and maintaining critical visual corridors.

4. A horseback riding concession has been added to the design proposal mirroring the historic use (cavalry stable) and expanding contemporary site functions in an appropriate manner.

5. The park may wish to consider acquiring (by fee system or easement) that portion of private land which contains the foundation remains of the original reservoir. This structure is a historically significant ruin in the complex and currently is not physically associated with the historic site.

6. A comprehensive maintenance program needs to be developed for the grounds of Fort Spokane. Elements of the plan should include

the following:

a) Attention to appropriate pruning techniques for remnant and new plant materials that address not only maintaining plant health and general safety but also the natural and historic character of a particular species.

b) Attention to the degree of maintenance given to each area, balancing various current uses, resources and historic character.

c) Attention to the seasonal aspects of the site (climate, visitor traffic, etc.) that influence intensities and patterns of use.

The lighting fixtures and locations
The entry gate

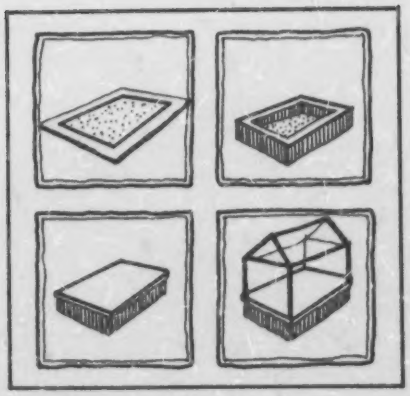
RESEARCH AREAS

During the course of the project, research and field work uncovered some inconsistencies among documented sources and historical accounts. The timeframe alloted for this study did not permit indepth research to clarify discrepancies. The following is a list of study areas that could enhance our understanding of the entire site:

Verify exact locations and size of:
- The military cemetery
- Outbuildings behind officers' row
- The ice house
- Post traders complex
- The Nee store
- The pumphouse along Spokane River

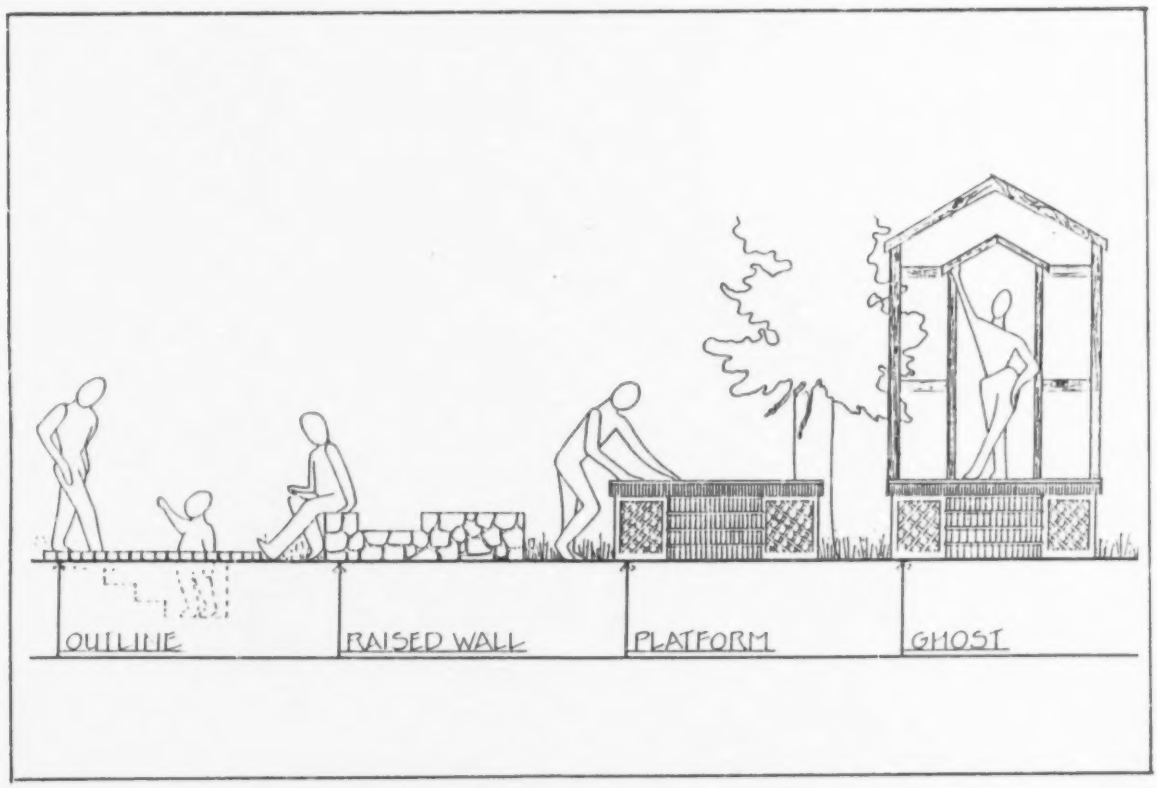
Additional general information on:
- The tennis court
- The shooting range
- The hay scale

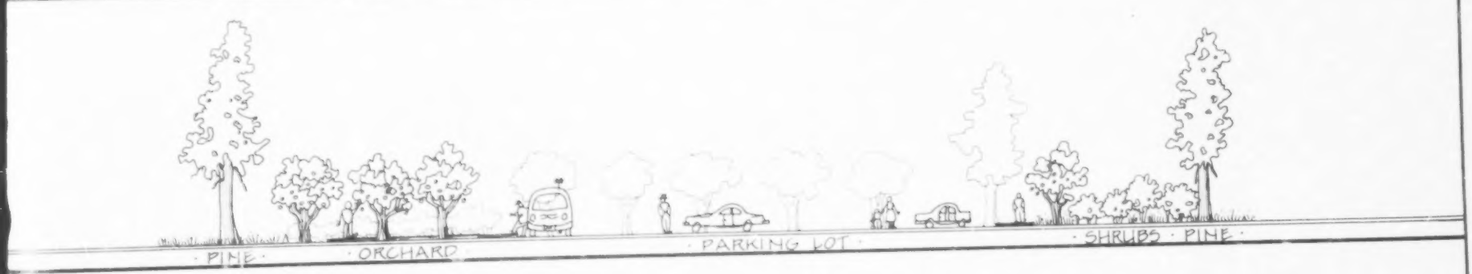
FOUNDATION TREATMENTS

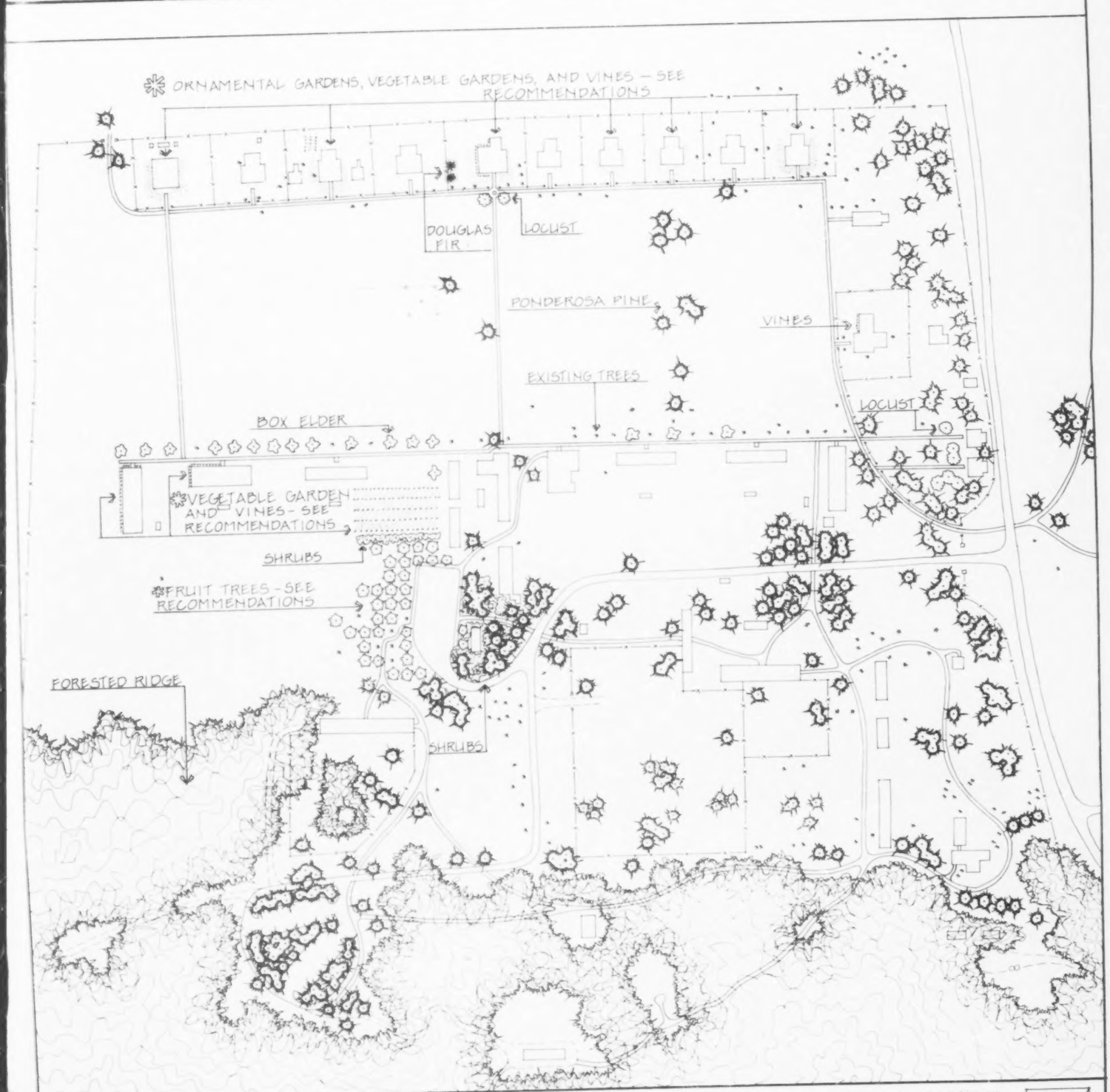


FOUNDATION TREATMENTS

All foundations representing the original structural complex of Fort Spokane are to be accurately located, stabliized and maintained (see recommendations). In addition, the design proposal delineates specific treatments for each individual foundation based on historical significance and design criteria for enhancing the visual definition of the complex as a whole. Those structures with the greatest historical significance--as determined in the evaluation process--are to receive the greatest visual definition. For example, the commanding officer's/school superintendent's residence and the headquarters/administration building are critical buildings for understanding the functional aspects and structural forms of the site, while the various outbuildings, including woodsheds and privys, are not as important. Four different foundation treatments are proposed: outline, raised wall, platform, and ghosted. All treatments are delineated on the Master Plan.







FORT SPOKANE — PLANTING PLAN —

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCE DIVISION

NORTH

100 50 0 100

SCALE · 1" = 100'-0"

· MAP SOURCES AS NOTED IN: THE HISTORIC LANDSCAPE OF FORT SPOKANE A DESIGN PROPOSAL
· COMPILED BY GILBERT AND NIEDZWIECKA · JULY 1985
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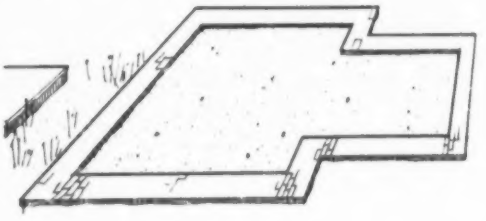
SHEET 7 OF 7

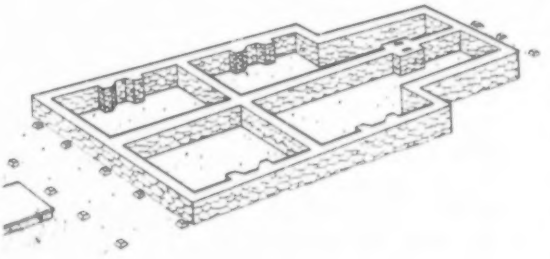
OUTLINE:

Used for the least significant foundations. The outline treatment clearly denotes the location of the structure but does not "read" from a distance. A 1-1/2 foot wide brick band outlines the foundation at grade. For excavations, such as the root cellar, the brick band serves to help stabilize the tops of the walls while preventing encroachments by vegetation. The bottom of the excavation is filled with 1-1/2 feet of sand to protect the archeological resource and a stairway can provide visitor access for interpretive purposes.



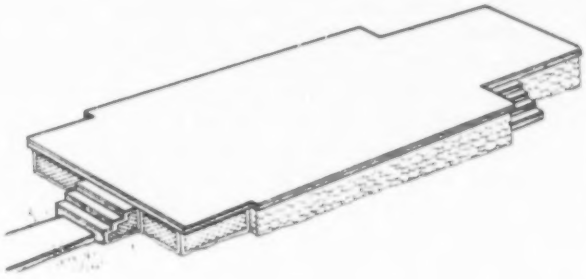
RAISED WALL:

For structures of greater significance, raised walls 1-1/2 feet high are built around the foundation footprint. These sites are easily perceived and "read" from a distance. Constructed from remnant materials, (located near the 'boneyard') this treatment also begins to help the visitor understand the material and mass of the buildings.



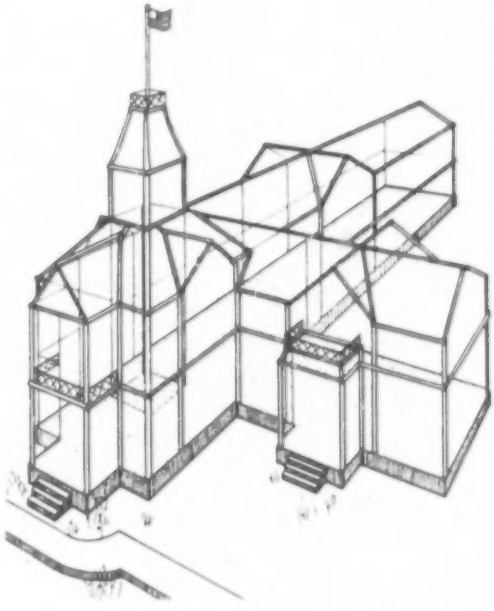
PLATFORM:

Along with raised walls, platform treatments are used to raise building fabric to a more perceivable level. Platforms are constructed over foundation footprints including porches and verandas. Having much more mass, they "read" from a greater distance. Floor plans are painted on the surface of the platform, allowing the visitor to imagine the size and scale of the rooms and verandas by climbing on the the platform.

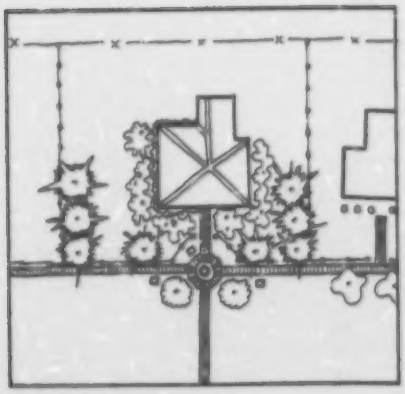


GHOST:

The greatest design treatment for foundations of critical historic or design significance. White painted timbers will outline the frame of the building as if all the siding and roofing had fallen off, leaving only the structural frame. Ghosted structures are visible from virtually any location in proximity to the fort, and give the visitor a strong sense of building scale, shape, and massing. These frames can have vines trained on wire to shade the verandas of selected structures (see Planting Plan). The adminstration building could be embellished with a functional tower, with a circular stairway leading to a flag-topped cupola, mirroring the historic design.



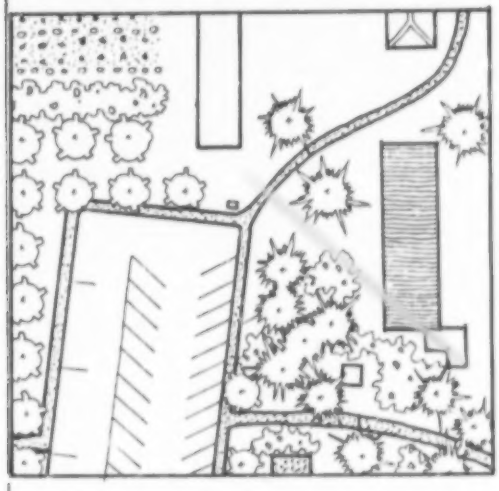
STAGING AREAS

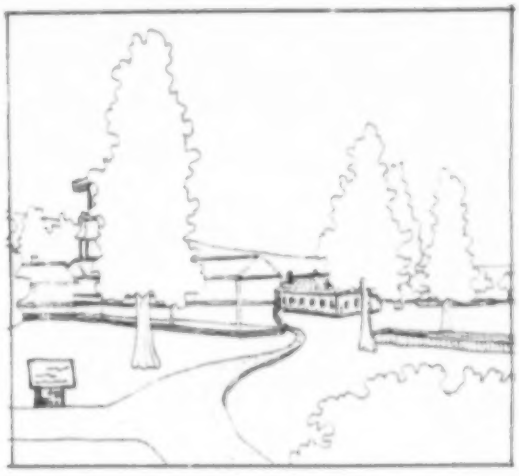


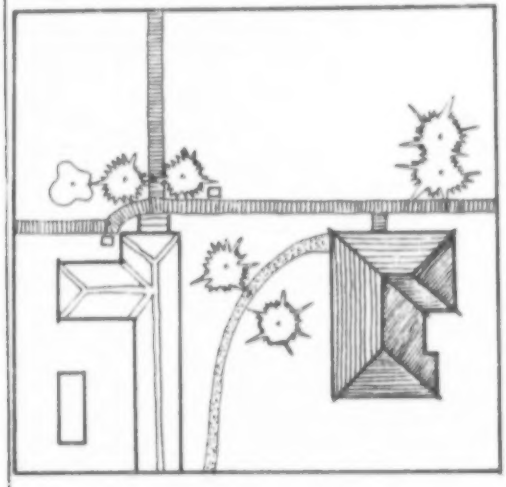
STAGING AREAS

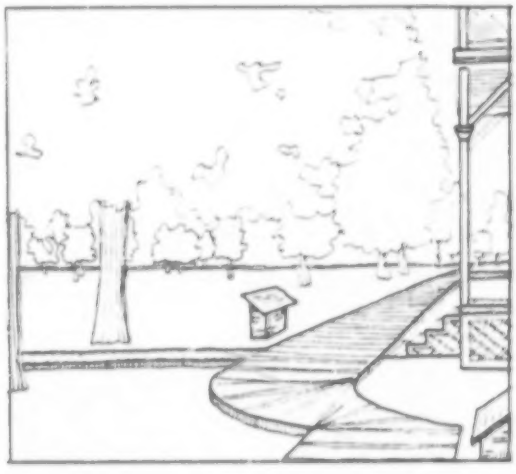
Pedestrian staging areas have been placed at several key locations on the plan. These areas are designed in association with the interpretive walk and are designed around focal points and gathering areas along the trail. The location of each staging area is designed to allow visitors the opportunity to pause, change direction, or digest various kinds of information from a single point.

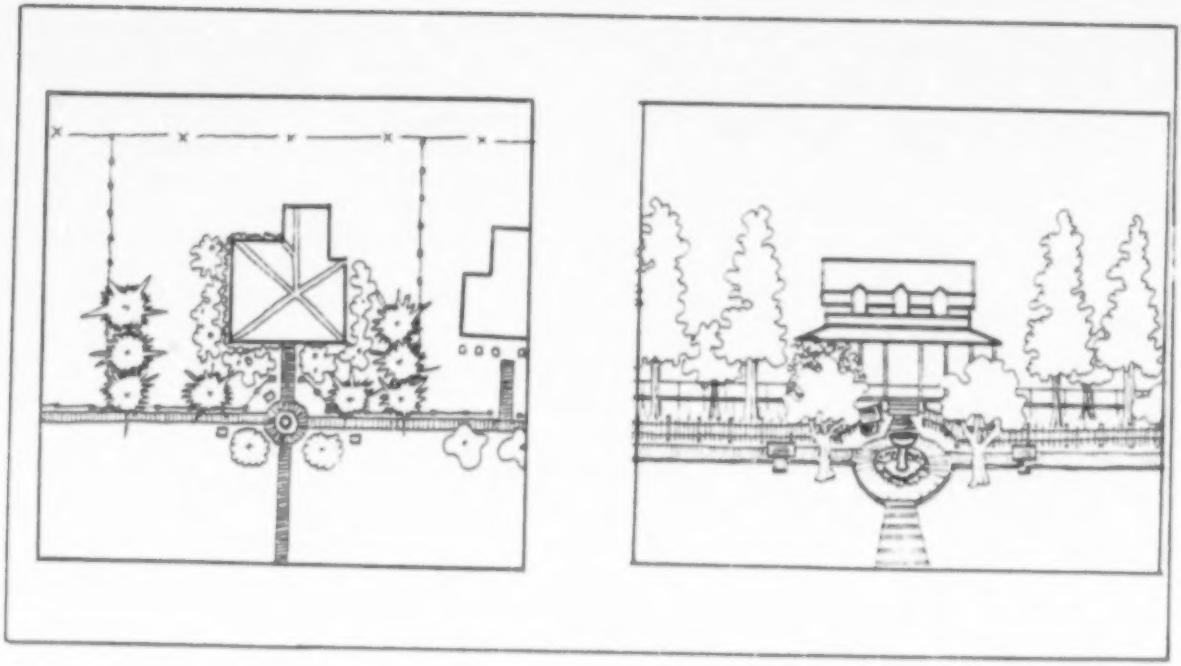
Four staging areas are proposed in the Master Plan: the parking lot, the administration building, the commanding officer's/superintendent's residence, and the sawmill. While the specific design for each area may vary, the materials, scale, and construction detailing should remain consistent among all four stations.

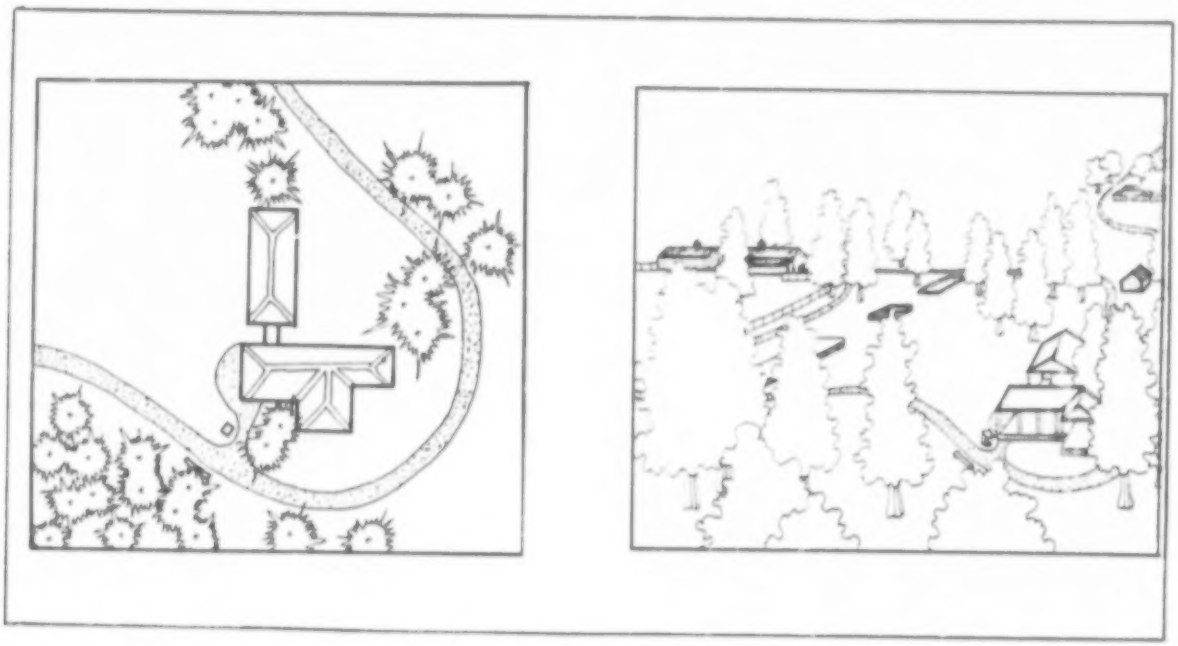




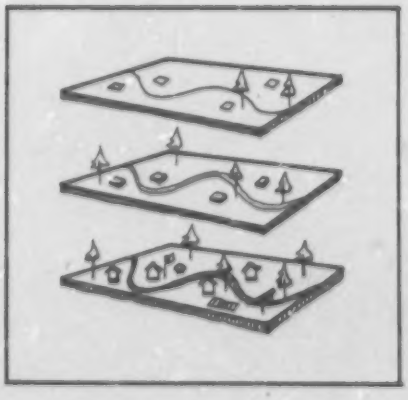








PHASING CONCEPTS



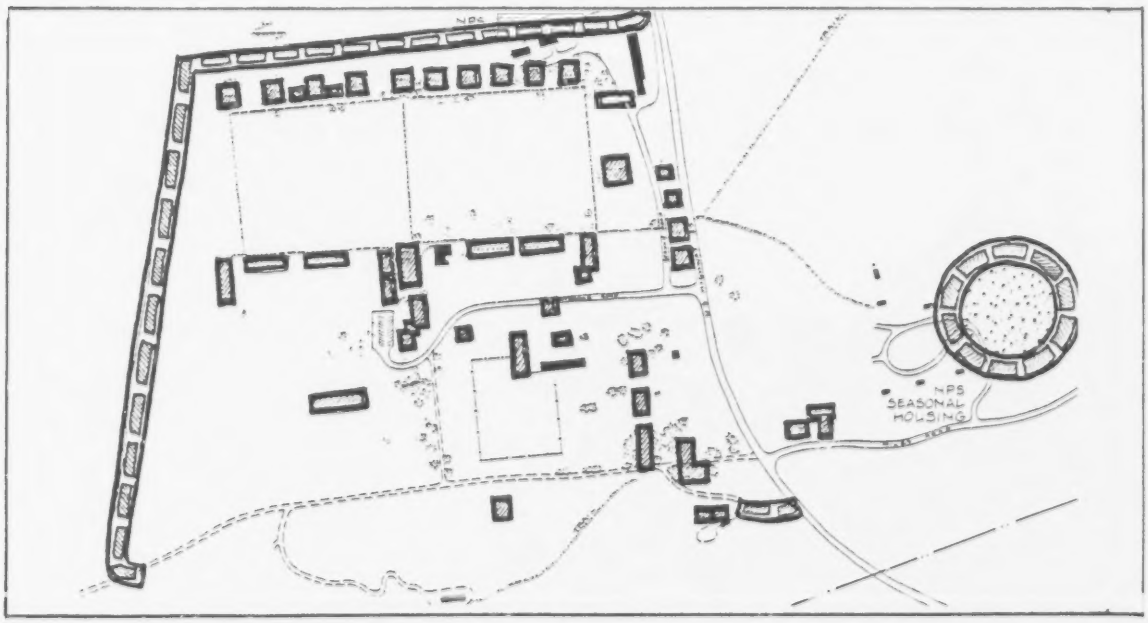
PHASING CONCEPTS

Budget and programming schedules may restrict the immediate and comprehensive implementation of the Master Plan. To support and facilitate implementation, the Plan has been divided into three levels, or phases, of development. In all individual levels, the essential concept of bringing the site "up" as a whole complex is the key to fulfilling the design intent discussed throughout this document. Each phase draws from the recommendations outlined on pp. 29-32 and combines elements from eacn major category in order to promote a comprehensive site program. In this regard, each phase is complete in itself. Each successive phase, however, is designed to incorporate a number of significant details and features that further enhance overall readability of the historic site.

PRE-CONSTRUCTION

Prior to implementation, preliminary site preparation should occur. This work preceeds the phasing program and sets the context for future work.

- o Conduct archeological investigations on foundations in order to verify and delineate the exact locations of each one
- o Construct new service roads to the water tanks and around the perimeter of the historic site, as indicated on the Master Plan
- o Prepare the site at seasonal circle for new construction (eventual transfer of NPS facilities)



PHASE 1

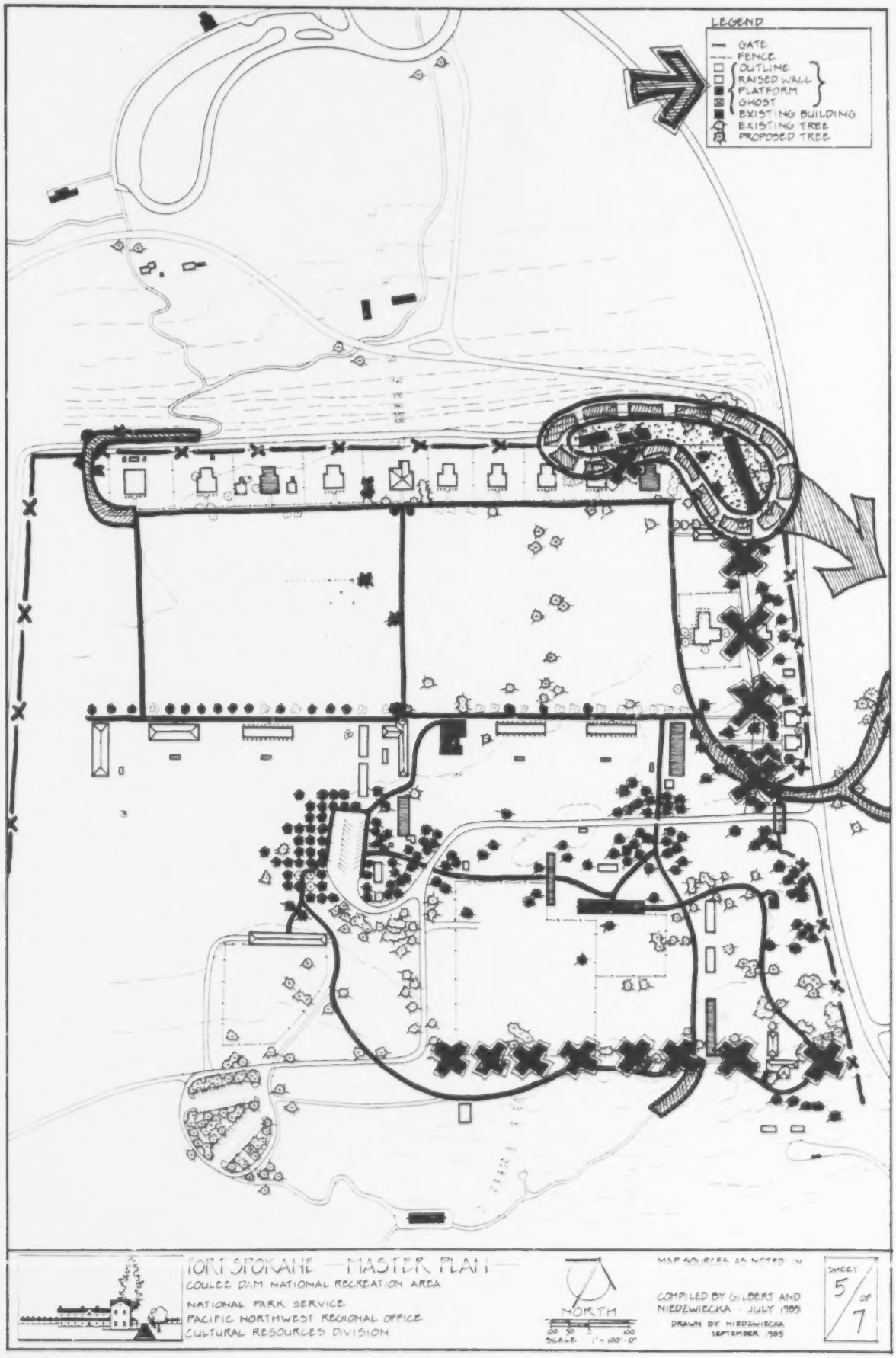
Phase I has three objectives:

1. To remove contemporary intrusions on tne historic site
2. To reestablish primary historic fabric
3. To implement surface treatment of foundations

These objectives can be met through the following actions:

- Move NPS facilities to seasonal circle
- Obliterate existing service roads providing access to north corner of the site and along base of east ridge behind the corral
- Reestablish historic boundary fence and gates
- Begin implementation of Planting Plan including grassland revegetation program
- Construct pedestrian trails linking adjacent sites with the fort, including a trail from the campground to the main gate and from the west corner from the fort to the campground
- Complete the entire interpretive trail as proposed in the Master Plan
- Conduct surface treatments of all foundations (see FOUNDATION TREATMENTS pg. 33 , and Master Plan)

By the end of Phase I, all foundations are delineated, the historic site boundary is in place, off-site connections are made, the circulation system is defined, and the revegetation plan is underway.


LEGEND
GATE
FENCE
OUTLINE
RAISED WALL
PLATFORM
GHOST
EXISTING BUILDING
EXISTING TREE
PROPOSED TREE
FORT SPOKANE — MASTER PLAN
COULEE DAM NATIONAL RECREATION AREA
NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCES DIVISION
NORTH
SCALE 1" = 100'-0"
MAP SOURCES AS NOTED
COMPILED BY GILBERT AND NIEDZWIECKA - JULY 1985
DRAWN BY NIEDZWIECKA SEPTEMBER 1985
SHEET 5 OF 7

PHASE 2

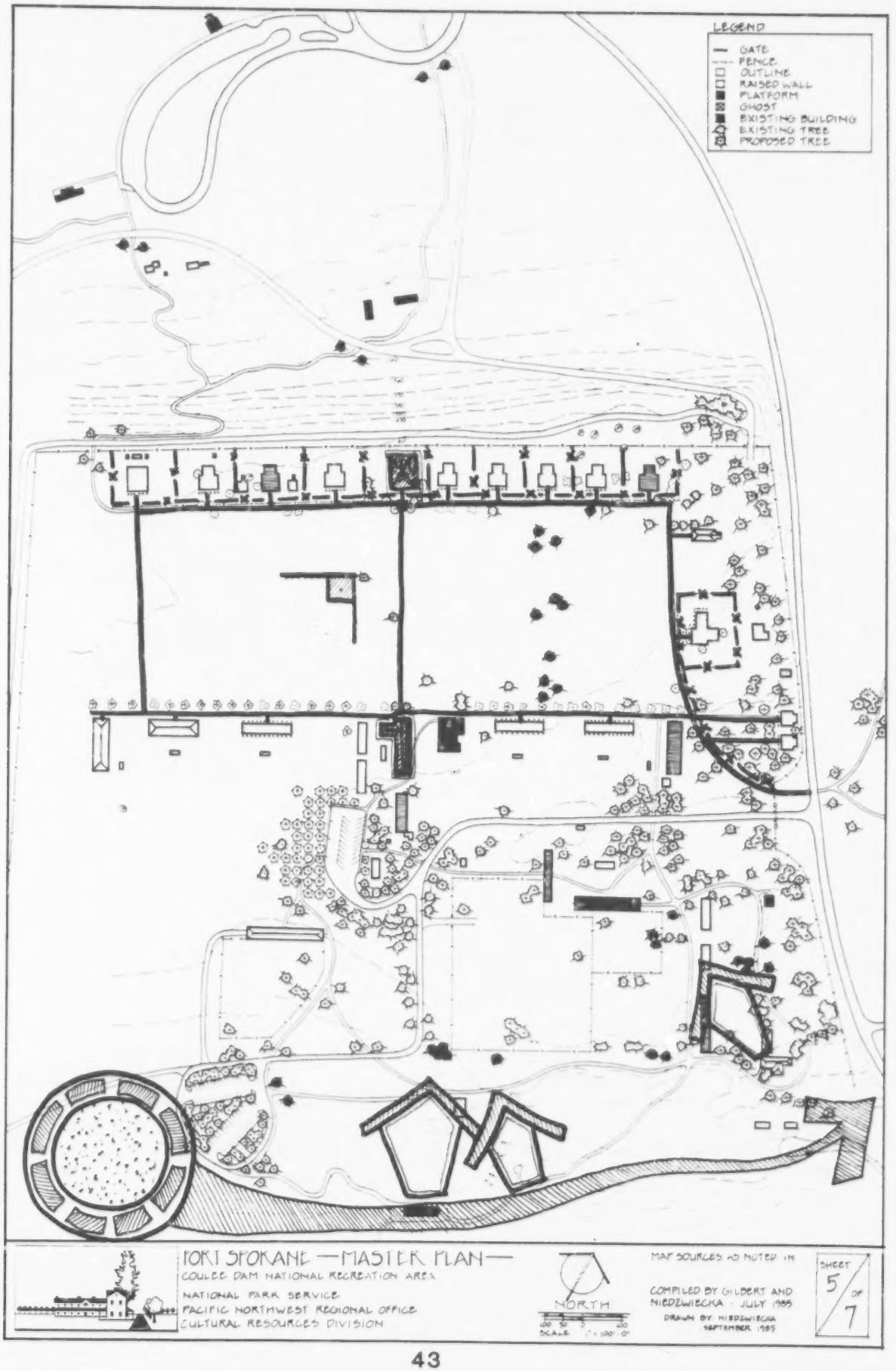
Phase II has three objectives:

1. To remove remaining contemporary intrusions
2. To enhance visual connections to and from the site
3. To add a layer of detail to the historic fabric

These objectives can be met through the following actions:

- Move the "boneyard" to its new location off the historic site
- Construct boardwalk sections of the interpretive trail as indicated on the Master Plan
- Construct picket fences and gates around the building foundations of officers' row and along the boardwalk leading to the entry gate.
- Selectively clear and open designated view corridors as indicated on the Planting Plan
- Ghost the commanding officer's/superintendent's residence and the administration building
- Reestablish the baseball diamond

By the end of Phase II, the site reads from the campground and Highway 25 (with ghosted structures), all intrusions are removed, the boardwalk is complete, details are added, and the site as a whole is visually and interpretively expanded.


LEGEND
GATE
FENCE
OUTLINE
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PLATFORM
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EXISTING BUILDING
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CULTURAL RESOURCES DIVISION
NORTH
SCALE 1" = 100'-0"
MAP SOURCES AS NOTED IN
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SHEET 5 OF 7

PHASE 3

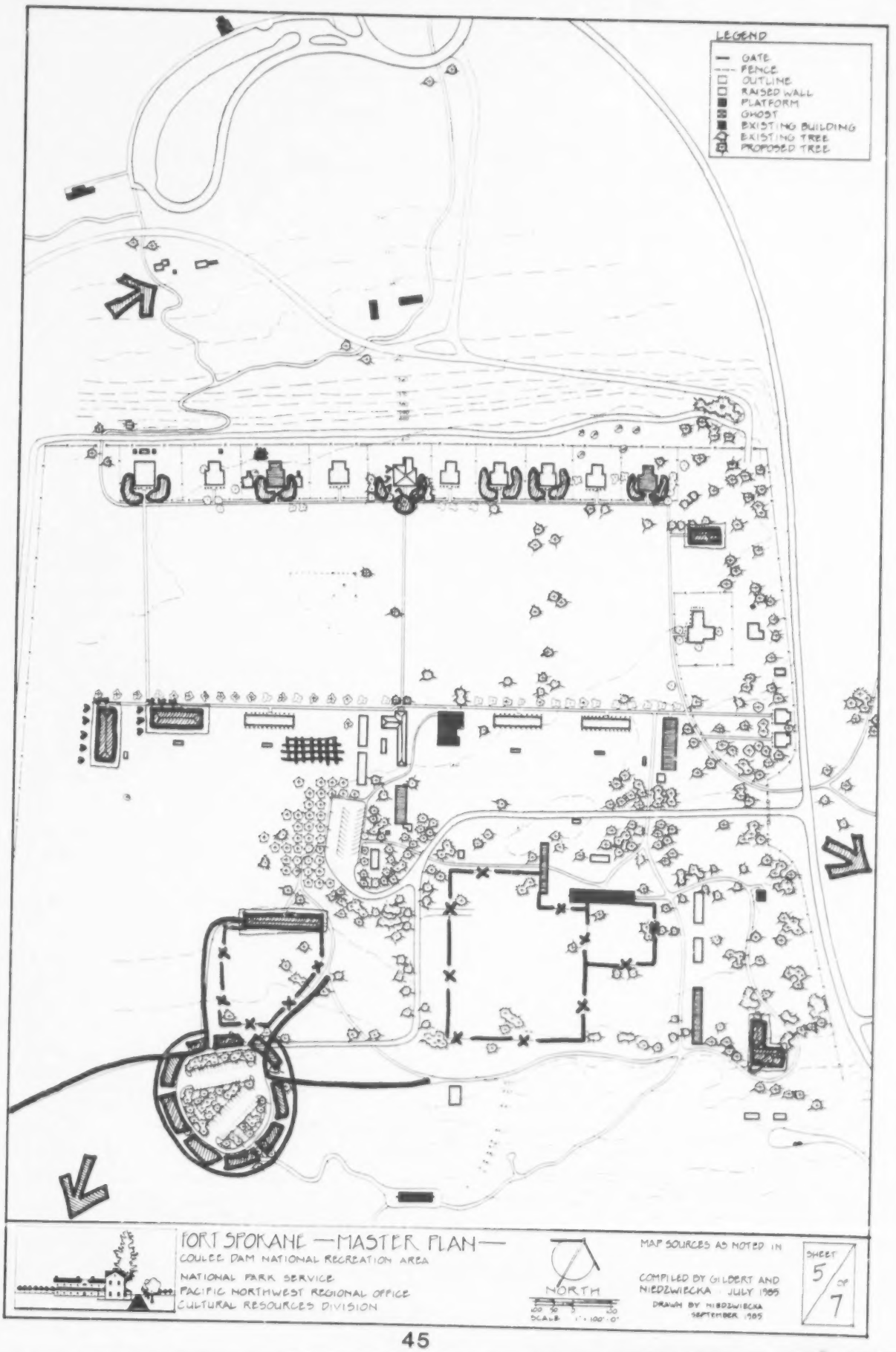
Phase III has two objectives:

1. To expand contemporary site uses
2. To complete implementation of the Master Plan

These objectives can be met through the following actions:

- Ghost the barracks, the chapel and the sawmill (see Master Plan)
- Plant vines on ghosted structures and complete ornamental plantings
- Construct (concession) stable, corral, and horseback riding trails
- Construct overflow parking, pave access road, and complete all pedestrian trails
- Construct pull-off/overlook by spring house and stabilize (original) reservoir
- Complete all interpretive and special features
- Connect the Nee and Post Trader sites with fort site for interpretive use
- Extend trails from the fort to Porcupine Bay, Seven Bays, and Hawk Creek
- Enlarge quartermaster corral to its historic dimensions

With the completion of Phase III, the site has reached comprehensive design development. Contemporary use facilities are expanded, large-scale circulation systems linking the site to outlying areas are in place, and a variety of detail elements are completed.



FORT SPOKANE — MASTER PLAN —

COULEE DAM NATIONAL RECREATION AREA

NATIONAL PARK SERVICE
PACIFIC NORTHWEST REGIONAL OFFICE
CULTURAL RESOURCES DIVISION

MAP SOURCES AS NOTED IN

COMPILED BY GILBERT AND NIEDZWIECKA - JULY 1985

DRAWN BY NIEDZWIECKA SEPTEMBER 1985

SHEET 5 OF 7

APPENDIX AND BIBLIOGRAPHY

PLANTS

TREES:	
Acer negundo	Box Elder
Pinus ponderosa	Ponderosa Pine
Pseudotsuga menziesii	Douglas Fir
Robina psuedoacacia	Locust
Fruit Trees: Apple, Plum	
SHRUBS:	
Arctostaphylos patula	Green Manzanita
Ceanothus velutinus	Snowbrush Ceonothus
Crataegus douglasii	Black Hawthorn
Holodiscus discolor	Creambush Oceknspray
Mahonia aquifolia	Oregon Grape
Lomicera spp.	Honeysuckle
Parthenocissus quinqueflia	Virginia Creeper
Physocarpus Malvaceus	Mallow Ninebark
Purshia tridentata	Bitter Brush
Rosa nutkana/woodsii	Wild Rose
Sambucus racemosa	Elderberry
Spiraea betulifolia	Shineyleaf Spirea
Symphoricarpos albus	Snow Berry
VINES:	
Parthenocissus tricuspidata	Boston Ivy
Vitus vinifera	Grape
HERBACIOUS PLANTS:	
Tagetes	Marigold
Valeriana Officinalis	Heliotrope
Verbena	Verbena

EVALUATION AND RECOMMENDATIONS FOR RESEEDING PROJECTS AT FORT SPOKANE NATIONAL HISTORIC SITE

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INTRODUCTION

The area near the guardhouse and the stable at Fort Spokane National Historic Site was prepared for seeding of perennial grasses in the summer of 1984. Methods used for seedbed preparation can be obtained from Harry Dove, Maintenance Foreman, at Fort Spokane National Historic Site. Whitmar bluebunch wheatgrass (Agropyron inerme) and hard fescue (Festuca ovina var. duriscula) were drill seeded in early April 1985. The objective of this project was to replace diffuse knapweed (Centaurea diffusa)and cheatgrass (Bromus tectorum) with the perennial grasses Whitmar bluebunch wheatgrass and hard fescue.

METHODS

On July 10, 1985 establishment of perennial grass seedlings was evaluated. Although the entire area was prepared and seeded at the same time, it was subdivided into three units for evaluation. The subunits evaluated included: Unit 1) the area west of the guardhouse; Unit 2) the area east of the guardhouse between the new visitor access road and the old visitor access road; and, Unit 3) the area east, north, and west of the stable (Figure 1).

Frequency and density of Whitmar bluebunch wheatgrass, hard fescue, and diffuse knapweed (Centaurea diffusa) was determined in 1 square foot circular plots. One hundred plots were measured in Units 2 and 3; 50 plots were counted in Unit 1. Each unit was traversed by foot and plots were measured at approximately 10m intervals. Three transects were used in each unit.

Data were summarized by determining frequency and density for Whitmar bluebunch wheatgrass, hard fescue, and diffuse knapweed in each unit. Additionally, since the objective of this seeding was to establish perennial grasses, frequency and density of Hard fescue and Whitmar bluebunch wheatgrass were combined. The mean, standard deviation, and 95% confidence limits for the average density per square foot were determined.

RESULTS

Perennial grasses were present in 24% of the plots in Unit 1, 51% in Unit 2, and 59% in Unit 3 (Table 1). Whitmar bluebunch wheatgrass was present in 24 to 45% of the area sampled; frequency of hard fescue ranged from 2 to 27%.

Average density of Whitmar bluebunch wheatgrass, ranged from 0.24 to 0.72 seedlings per square foot, and this was higher than 0.04 to 0.48 seedlings per square foot for hard fescue (Table 1). More perennial grasses established in Units 2 and 3 than in Unit 1. Establishment of Whitmar bluebunch wheatgrass was higher than hard fescue in Unit 1, but their establishment was similar in Units 2 and 3.

Established diffuse knapweed was found in 25% or less od the plots; density of diffuse knapweed averaged less than 0.51 plants per square foot (Table 1).

CONCLUSIONS AND RECOMMENDATIONS

Spring seeding and extremely dry conditions during the spring and summer of 1985 may have been the most important factors limiting establishment of perennial grasses. Establishment of Whitmar bluebunch wheatgrass was superior to hard fescue under the dry conditions at Fort Spokane in 1985. Seedings in the arid region of the Pacific Northwest are successful if frequency of plants is near 100% and the lower limit of 95% confidence intervals for seedling density exceeds 1. Poor establishment of perennial grasses, 0.12 to 1.51 seedlings per square foot, necessitates additional seeding on the area. The entire area should be reseeded because the lower limit of the 95% confidence intervals for seedling density was less than 1.0 perennial grass seedling per square foot in all units. Frequency of perennial grass was 59% or less, indicating established seedlings were not evenly distributed throughout the units. Frequency data indicates seedlings failed to establish on 76% of Unit 1, 41% in Unit 2, and 49% of Unit 3.

These units must be mowed immediately to limit seed production by diffuse knapweed. Height of mowing should be approximately 6 inches. Since weed populations are not high, the areas should be interseeded with Whitmar bluebunch wheatgrass and hard fescue in fall 1985. Interseeding will not require disking to prepare the seedbed. Broadleaf weeds will be more abundant in the units in 1986 and it will be necessary to reduce their numbers. Therefore, the units should be sprayed with 2,4-D at 1 pound active ingredient per acre in the spring of 1986. Herbicide should be applied in late spring after maximum numbers of diffuse knapweed seedlings have emerged and while they are in the rosette stage. Since all diffuse knapweed will not be eliminated by herbicide application, the areas should be mowed to limit seed production. Mow at approximately 6 to 8 inches high when diffuse knapweed is beginning to flower.

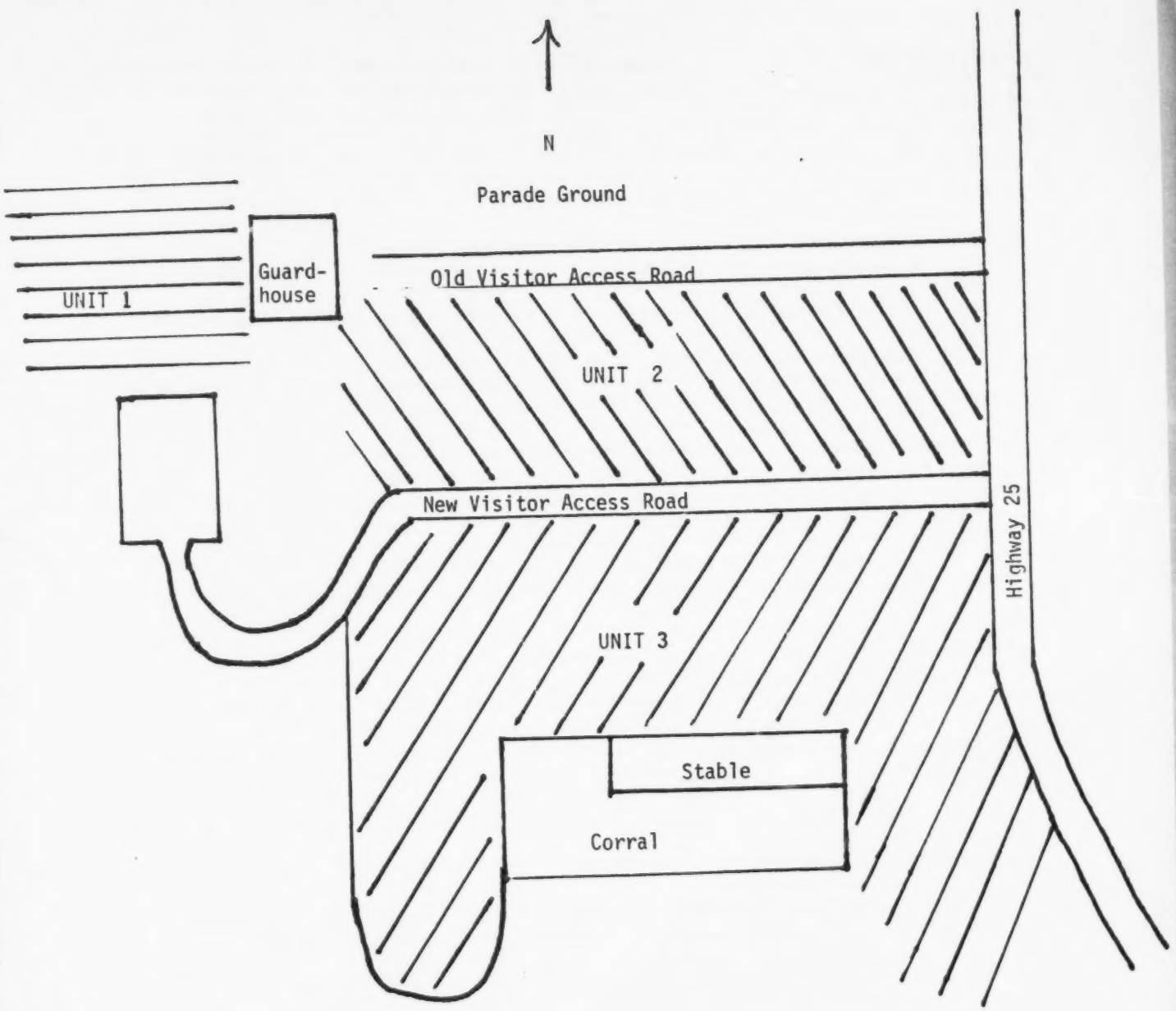

Figure 1. Schematic of the area reseeded and the units sampled at Fort Spokane National Historic Site.

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Table 1. Frequency, mean density ($\bar{x}$), standard deviation for density (s), and 95% confidence intervals for density of Whitmar bluebunch wheatgrass, hard fescue, Whitmar bluebunch wheatgrass and hard fescue, and diffuse knapweed at Fort Spokane National Historic Site.

Species	Frequency	Seedlings per square foot		95% Confidence Interval
		$\bar{x}$	s	
UNIT 1: West of the guardhouse.				
Whitmar wheatgrass	22%	0.24	0.48	0.11--0.38
Hard fescue	2%	0.04	0.20	-0.02--0.10
Whitmar wheatgrass and Hard fescue	24%	0.26	0.49	0.12--0.40
diffuse knapweed	0	0.00	0.00	0.00
UNIT 2: East of the guardhouse between the old visitor access road and the new visitor access road.				
Whitmar wheatgrass	45%	0.72	1.07	0.51--0.93
Hard fescue	24%	0.48	1.11	0.26--0.70
Whitmar wheatgrass and Hard fescue	59%	1.23	1.69	0.90--1.57
diffuse knapweed	15%	0.32	0.83	0.16--0.49
UNIT 3: East of stable, between new visitor access road and stable, and west of the stable.				
Whitmar wheatgrass	34%	0.52	0.86	0.35--0.69
Hard fescue	27%	0.45	0.97	0.26--0.64
Whitmar wheatgrass and Hard fescue	51%	0.93	1.35	0.66--1.20
diffuse knapweed	25%	0.51	1.18	0.28--0.74

RECOMMENDATIONS FOR RESEEDING THE PARADE GROUNDS AT FORT SPOKANE NATIONAL HISTORIC SITE

INTRODUCTION

Before Fort Spokane was established, bitterbrush (Purshia tridentata) and needle and thread grass (Stipa comata) probably dominated the parade ground and surrounding area. Presently, the parade ground is dominated by diffuse knapweed (Centaurea diffusa) and cheatgrass (Bromus tectorum). Changes in the vegetation are the product of disturbances including deliberate removal of native species by the military and cultivation and seeding. After the military established the fort, they apparently removed the bitterbrush, leaving needle and thread grass for ground cover. At least three lines of evidence support this conclusion. First, bitterbrush and needle and thread grass are naturally reestablishing on the parade ground, second, the bitterbrush - needle and thread grass association is well developed along the entire margin of the parade ground, and third, historic photographs of the parade ground and officers row show what appears to be needle and thread as a common grass. Later some of the area was cultivated and reseeded to smooth brome (Bromus inermis), alfalfa (Medicago sativa), and pubescent wheatgrass (Agropyron tricophorum).

The following are recommended procedures for establishing perennial grasses on the parade grounds at Fort Spokane National Historic Site. These recommendations are based on discussions with Cathy Gilbert and Renata Niedzwiecka, Landscape Architects from the Regional Office, and Harry Dove, Maintenance Foreman at Fort Spokane National Historic Site. The objective of this project is to restore the historic scene with low maintenance vegetation by replacing diffuse knapweed and cheatgrass with hard fescue.

The location of the parade ground and the sandy loam soils make the area particularly susceptible to wind erosion if the seedbed is prepared with disking. The following recommendations for no tillage seedbed preparation and seeding are designed to minimize disturbance on the site and limit wind erosion. Herbicides and fire are recommended for reducing diffuse knapweed and cheatgrass before seeding to hard fescue. Herbicides may also be needed to reduce weeds after the area is seeded.

OUTLINE OF PROCEDURES FOR WEED CONTROL, SEEDBED PREPARATION, AND SEEDING

Initiation of this project is planned for 1986, therefore the following recommendations have been developed within this time frame.

1986

A. The parade grounds should be sprayed with 2,4-D at 1.0 pound active ingredient per acre when diffuse knapweed is in the rosette stage.

B. The parade ground should be burned when cheatgrass is in the red stage. Cheatgrass should be burned when plants are dry enough to carry a fire, but before they have shed their seeds. Backfires should be used.

C. Hard fescue is the species selected for restoring the historic landscape. Although hard fescue is difficult to establish, it is drought tolerant, long-lived, and it outcompetes and suppresses diffuse knapweed.

Rangeland species are normally seeded at 20 PLS* per square foot. However, since the soils of the parade ground are well drained sandy loam and seedbed preparation will be minimal, hard fescue should be seeded at 40 PLS per square foot. Hard fescue must be drill seeded in the fall of 1986.

1987

A. The seeding should be evaluated by counting the number of hard fescue seedlings and diffuse knapweed plants in 1 square foot plots. Determine the mean and variance for hard fescue and diffuse knapweed density, and frequency of hard fescue. Construct 95% confidence limits for the mean number of hard fescue seedlings. If the lower limit of the 95% confidence limit is less than 1.0, and the frequency of hard fescue seedlings is less than 90%, it may be necessary to interseed. If interseeding is necessary, it should be completed in the fall of 1987.

B. The area should be mowed when diffuse knapweed is beginning to bloom. Mowing height should be approximately 6 inches.

1988

A. Spray the area with 2,4-D at 1.0 pounds active ingredient per acre when diffuse knapweed seedlings are in the rosette stage.

B. The seeding should be reevaluated using the methods described above.

C. Mow the area at a height of approximately 6 inches when diffuse knapweed is beginning to flower.

1989 and the following years.

When hard fescue is established, it will suppress diffuse kanpweed, but mowing will be necessary until it dominates the site. Mow the area once per year when diffuse knapweed is beginning to flower.

* PLS is Pure Live Seed = Seed Purity X Percent Germination

Example: Purity= 80%= 0.80
Percent Germination= 50%= 0.50
PLS= (0.80 X 0.50)= .40= 40%
1/PLS= Pounds of bulk seed required to equal 1 pound PLS
1/0.40= 2.50 pounds of bulk seed required for 1 pound PLS

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